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PHTHISIS:

ITS MORBID ANATOMY, ETIOLOGY, SYMPTOMATIC EVENTS AND COMPLICATIONS, FATALITY AND PROGNOSIS, TREATMENT AND PHYSICAL DIAGNOSIS.

IN A SERIES OF

CLINICAL STUDIES.

BY

AUSTIN FLINT, M.D.,

PROFESSOR OF THE PRINCIPLES AND PRACTICE OF MEDICINE AND OF CLINICAL MEDICINE IN THE
BELLEVUE HOSPITAL MEDICAL COLLEGE, FELLOW OF THE NEW YORK ACADEMY OF MEDICINE,
ASSOCIATE FELLOW OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA,
HONORARY MEMBER OF THE CLINICAL SOCIETY OF LONDON, CORRESPONDING
MEMBER OF THE ACADEMY OF MEDICINE IN
PALERMO, ETC. ETC.

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TO

SAMUEL D. GROSS, M.D., LL.D., D.C.L. OXON.,
PROFESSOR OF SURGERY IN THE JEFFERSON MEDICAL COLLEGE,

WITH

ADMIRATION FOR HIS TALENTS, ATTAINMENTS, AND LABORS

AS A

TEACHER AND AUTHOR;

WITH THE

HIGHEST ESTEEM FOR HIS PROFESSIONAL AND PRIVATE CHARACTER;

WITH

CHERISHED REMEMBRANCE OF SOCIAL RELATIONS AS A COLLEAGUE,

AND WITH A

GRATEFUL APPRECIATION OF HIS FRIENDSHIP,

This Volume

IS AFFECTIONATELY

DEDICATED.

PREFACE.

THIS volume is the result of much labor, not only in the careful recording of over six hundred and seventy cases of Phthisis, but in the abstracting, grouping, and analysis of them with reference to practical deductions. Whether the result has any value proportionate to the labor which it has cost must be left for the reader to decide, but the author trusts that the series of clinical studies which the volume embraces will not be without interest and importance for the practitioner. Whether this be so or not, his past experience assures him of kindly consideration on the part of his professional brethren.

NEW YORK, October, 1875.

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ERRATA.

Page 133, 2d line in paragraph 3, *for* "anæmia," *read* uræmia.
" 221, in heading of Case 3, *for* "complete," *read* comfortable.

PHTHISIS:

A

SERIES OF CLINICAL STUDIES.

INTRODUCTION.

The purpose, in the pages which are to follow, is to give the results of clinical studies relating to phthisis. Notwithstanding the pathological distinctions, the nosological subdivisions, and the variety of names which are to be found in recent medical literature, the terms phthisis, pneumonic phthisis, and pulmonary consumption, apply to a well-defined class of cases. In a clinical or practical view, the application of these terms occasions no difficulty nor confusion. Applied without any qualification, they denote a chronic affection. For the most part, the cases which I am about to study are cases of chronic disease. I shall, however, embrace in my studies some cases of the affection known as acute miliary tuberculosis, and, also, some cases of the form of chronic disease called fibroid phthisis, or cirrhosis of the lung. With these few exceptions, all the cases belong to a class remarkable for uniformity as regards the character of lesions, together with the symptomatic events and laws which belong to the clinical history. With the disease in its ordinary form, all physicians, from its frequency, are but too familiar.

Of the cases of phthisis which had come under my observation up to the time of entering on these studies, I have preserved notes of a considerable number, namely, six hundred and seventy. These cases were noted during a period of thirty-four years. For twenty-five years I made notes of nearly all the cases which I observed, both in private and in hospital practice; but for the past nine years my field of clinical observation has been so large, and my professional duties have been so much increased, that the cases of phthisis which I have noted bear but a very small proportion to those observed. Moreover, the number of cases which I had already noted was so large, that I felt a desire to accumulate notes of cases of other diseases rather than to increase my collection of cases of phthisis. This latter consideration affected especially my notes of hospital cases; hence, of the cases which I have noted, much the larger proportion were in private practice.

My notes present much diversity in minuteness and completeness. For the reasons just stated, those made of late years are comparatively brief. Formerly they were quite full as regards the previous history, together with the symptoms, physical signs, etc., while the cases were under my observation. But a pretty large proportion of the cases were not under my observation during the whole course of the disease, and many were observed for only a short time, the patients not infequently residing at a distance, and, therefore, seen by me only once or twice. With regard to the latter cases, however, I have, in a considerable proportion, obtained information of the subsequent histories.

Notwithstanding the imperfections of many of the histories, the analytical study of so large a collection of cases will, as I cannot but think, lead to results of sufficient value to repay the labor which they will cost. I have entered upon the undertaking with this belief. Examining all the histories and classifying the data which they contain, I shall employ, as far as practicable, the numerical method of investigation with reference to various objects of inquiry, introducing histories to illustrate certain points of interest or importance, and giving abstracts of the cases studied with reference especially to the treatment of the disease. The various pathological questions connected with phthisis, which have of late given rise to much discussion, I do not propose to consider in this work. I shall refer to them only as they are suggested in connection with conclusions to which my studies may lead.

In the prosecution of my studies I shall adopt the following arrangement of topics: *First*, the morbid anatomy of phthisis; *second*, the etiology; *third*, symptomatic events and complications; *fourth*, fatality and prognosis; *fifth*, the treatment, and, *sixth*, the physical signs and diagnosis. These topics, as thus arranged, will be considered in separate chapters.

CHAPTER I.

MORBID ANATOMY.

Chronic phthisis a bilateral disease—The law of parallelism in acute miliary tuberculosis—Cases in which the right and the left lung were most diseased—Exceptions to the rule that the apex of the lung is first affected—Pulmonary cavities—Displacements of the heart in consequence of loss of the pulmonary substance—The morbid appearances in cases of acute miliary tuberculosis—Cases with pleurisy and pleuritic effusion—Phthisis and recent pericarditis—Phthisis and acute pneumonia—Collections of liquefied morbid products—Case of poisoning with aconite, a single small nodule the only evidence of phthisis—Case showing cicatrization eighteen years before death—Relationship of gray granulations and tuberculous exudation—The relative importance of gray granulations when associated with either exudation, liquefied morbid products, or cavities—Perforation of lung and pneumothorax—Coexistence of vesicular emphysema—Pleuritic adhesions—Interstitial pneumonia—Enlargement of bronchial glands and obstruction of a primary bronchus—Pulmonary apoplexy—Pulmonary gangrene—Dilatation of bronchial tubes—Diminished volume of lung—Circumscribed congestion in connection with hæmoptysis—Morbid appearances of the heart—Morbid appearances in the larynx and trachea—Intestinal ulceration—Disease of the mesenteric glands—Peritonitis—Gastric ulcer—Morbid appearances in the liver, spleen, and kidneys—Thrombosis of the iliac veins—Morbid appearances of the brain.

My notes embrace an account of the appearances after death in eighty cases. The appearances were not observed and noted with a view to a numerical analysis respecting the presence or absence of lesions in all the different organs and structures of the body. The researches of Louis, published nearly fifty years ago, leave not much to be desired, in this point of view, so far as morbid appearances are ascertained without the aid of the microscope. It is worthy of note that the researches of that conscientious and patient observer in the study of phthisis, as also of typhoid fever, are as valuable to-day as when they were made. He analyzed one hundred and twenty-three cases of phthisis, the histories embracing an account of the appearances after death, not only of the lungs, but of all the organs of the body. In these histories negative, as well as positive, facts were included; that is, the morbid appearances in different situations were described, and the absence of any morbid appearances was also noted. This was prior to the employment of the microscope in pathological studies. As regards microscopical appearances, the observations of Louis are, of course, defective; but, as far as they go, the facts developed by his laborious researches can only be invalidated by the occurrence of important changes in the laws of disease. In a large proportion of my cases the *post-mortem* examination was not complete, but limited to a greater or less number of organs, and in not a few of the cases, the only organs examined were those within the chest. The object which, more than any other, I had in view in my observations relating to the morbid anatomy, was to note the lesions in connection with the physical signs which had been already noted. The histories, moreover, are barren as regards microscopical appearances. With these defects, it remains to be seen how much value my autopsical records have; but, perhaps, considering the large number of cases, the results may repay the labor of the analysis.

Phthisis belongs eminently among the bilateral affections. This is shown by the exceedingly small number of exceptions to the rule that, after death, both lungs are found to be affected. The morbid appearances in my eighty cases were limited to one side in only two. The facts noted in these two cases are as follows: In one the left lung was entirely free from the disease. The right lung, in the upper and middle lobe, had several cavities which were anfractuous with traversing bands of condensed pulmonary tissue. There were neither granulations, miliary tubercles, nor any exudation. It is, perhaps, probable that, in this case, miliary tubercles had existed in both lungs, and had disappeared from the right lung, leaving no obvious traces of their existence. In the other case, the left lung was healthy. The right lung at the apex had a cavity of the size of a hazlenut, together with a small amount of solidification. Peritonitis from intestinal perforation, numerous large ulcers in the colon and rectum, and a few ulcerations in the small intestine, existed in this case. The liver and the kidneys were fatty, and the mesenteric glands were much enlarged.[1]

Although a bilateral affection, phthisis does not exemplify fully the law of symmetry. The two lungs are affected unequally. To this rule there are very few exceptions. The disparity is evidently owing to the affection being of older date in one lung than in the other. These statements apply to chronic phthisis, but not to the affection known as acute miliary tuberculosis. In a case of the latter affection both lungs were alike crammed with miliary tubercles which were also found in other organs. In a few other cases of the same affection, it is simply noted that both lungs were crammed with granulations or miliary tubercles.

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[1] Louis found the disease limited to one lung in 7 of 123 cases. In five cases it was limited to the left, and in two to the right, lung.

Is the greater amount of disease, in the majority of cases, seated in the right or in the left lung; or, what is an equivalent question, which of the two lungs is oftenest affected primarily? Of 55 cases, in 28 the greater amount of disease was in the right lung, and in 27 cases the left lung was most diseased. Hence, there is no uniform law as regards a greater tendency in either lung to phthisis. The practical bearing of such a law would relate chiefly to diagnosis; and it is evident that physical signs, when they are of a doubtful character, derive no diagnostic force from their situation on either side of the chest.[1]

It is a well-known fact that, as a rule, phthisis is either limited to the upper lobes, or, if it affect the lower lobes, it is greater in extent and more advanced in the former. The primary seat is at or near the apex, and the disease advances from above downward. Three cases only furnished exceptions to the rule. In one of these cases the lungs were adherent on both sides to the walls of the chest, excepting that, on each side, at the base there was a collection of puruloid liquid within the pleural cavity. At the base of the right lung there was a cavity of the size of an English walnut, anfractuous and evidently tuberculous. At the lower part of the left lung were several nodules. There was no affection at the upper part of either lung. In another of these cases the lower lobe of the left lung contained two cavities of the size of a large American walnut. Both lungs, in this case, were crammed with miliary tubercles, which were sufficiently numerous to produce solidification of the upper lobe of the left lung. Of the third case it is simply stated that there was an affection of the base corresponding to the signs noted during life.

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[1] Of 38 cases analyzed with reference to this point by Louis, the left lung was most affected in 28 and the right lung in 10; hence, he concluded that the left more than the right lung is liable to become affected.

In 62 of 78 cases there were cavities. The cases differed as regards the number of cavities, their size, and their existence in only one lung or in both lungs. It seems hardly worth while to determine numerical facts with respect to these points of difference. This may also be said of other points, such as the flaccidity, or otherwise, of the walls of the cavities, the number and size of the communications with the bronchial tubes, et cetera. An analytical investigation with reference to these details would not be likely to develop anything not sufficiently known already. I shall content myself with citing a few incidental circumstances.

In one case a large cavity, estimated to be of sufficient size to hold half a pint of liquid, contained several loose calcareous masses of irregular shape. Evidently they were too large to pass through the openings into the bronchial tubes, and had not, therefore, been expectorated.

In one case a portion of the upper part of the lower lobe of the right lung projected so as to form a tumor of the size of an American walnut. On section, this proved to be a cavity distended with air. There was a cavity of the apex of the lung as large as a small orange. The remainder of the upper lobe was solidified by recent exudation. A portion of the lower lobe was also solidified, and there were several small cavities in this lobe, in addition to the cavity, the anterior wall of which formed the projecting tumor.

In three cases there was blood within the cavities. In one of these cases there were two cavities at the base of the left lung, each of the size of a large American walnut, and each contained dark liquid blood. Both lungs were crammed with miliary tubercles. The bronchial glands were greatly enlarged; some hard and smooth on section, others of a cheesy consistence. The right primary bronchus was obstructed by the pressure upon it of one of the enlarged glands. The heart was normal. In another case a cavity of the size of an English walnut, at the summit of the right lung, was partially filled with sanguinolent serum and dark coagula. In the remaining case, a cavity at the left summit, of the size of an orange, was filled with coagulated blood, and also a smaller cavity communicating with the larger. Both cavities contained at least half a pint of coagula. They were much distended with the clots. In the rest of this lobe there were disseminated nodules. A small cavity, together with disseminated nodules, existed at the summit of the right lung.

Several of the cases furnished examples of very great destruction of lung by the formation of cavities. In one case it is noted that the "left lung was much contracted, and presented a series of communicating cavities extending from the apex nearly to the base, the two lobes being firmly united, and the whole lung closely adherent to the thoracic walls."

Displacement of the heart as a result of great destruction, with cavities of the right lung, was observed in two cases. In one of these cases the heart was situated on the right side of the sternum, and the displacement had taken place while the case was under observation. In the other case, the heart was, in like manner, displaced, and the pericardium was attached to the right lung at the site of a cavity of the size of a small orange. The walls of this cavity were flaccid, and, at the situation where it was adherent to the pericardium, they were quite thin. The inner surface of the cavity was rough. This case was of much interest on account of the production within the cavity of a very loud friction-murmur by the heart's action, resembling a pericardial friction-murmur. Reference will be made to the case in connection with the study of the physical signs. There was no pericarditis.

In 16 of 78 cases there were no cavities.

In 5 of these 16 cases the disease was *acute miliary tuberculosis.* The distinctive anatomical peculiarity of this affection is the presence in both lungs of either gray granulations or miliary tubercles (the latter name being applied after they have undergone a granulo-fatty metamorphosis), in immense numbers, together with their coexistence in other organs, namely, the spleen, liver, etc., without either cavities or solidification from exuded morbid products heretofore known as tuberculous infiltration or yellow tubercle. I shall give an abstract of the notes relating to the appearances after death in these five cases.

Case 1. Old pleuritic adhesions existed on both sides. Both lungs were stuffed with granulations. No exudation nor cavities. Nothing is noted of appearances in other organs.

Case 2. There were no pleuritic adhesions. The lungs were crammed with small hard tubercles, not larger than pins' heads. Both lungs were equally crammed. The spleen was enlarged and crammed with tubercles. There were some cheesy masses in this organ. The liver was studded with tubercles, and they were scattered throughout this organ. The peritoneum was studded with tubercles. The mesenteric glands were enlarged. The kidneys were free from tubercles.

Case 3. The left lung contained a great number of miliary tubercles, with no exudation, no cavity, and no adhesions. The right lung was firmly adherent to the sides of the chest, and contained miliary tubercles in great abundance, without exudation or cavity. The heart was normal. Other organs were not examined.

Case 4. There were old and strong adhesions on both sides. The lower lobe of the left lung was completely collapsed, being represented by a triangular mass two inches in length and width. It looked like a rudimentary lobe. The upper lobe contained miliary tubercles in very great abundance. The bronchial tubes were moderately dilated. The left primary bronchus was a third larger than the right. There was no exudation and no cavity. The upper lobe of the right lung contained numerous miliary tubercles, and there were a few in the lower lobe. The heart was moderately enlarged, without valvular lesion. The aorta was atheromatous. Other organs were not examined.

Case 5. A very large number of gray granulations and yellow miliary tubercles not larger than pins' heads were scattered through both lungs. There was no cavity and no infiltration. The bronchial glands were enlarged. The liver, spleen, and kidneys contained miliary tubercles. There were a few small ulcerations in the small intestine. Three mesenteric glands were enlarged and softened. Over the convex surface of the brain on both sides of the longitudinal fissure, and on the superior surface of the cerebellum, there was a considerable number of soft yellowish masses. They were in the pia mater and extended a little into the brain-substance. They varied in size from that of a pin's head to one-fourth of an inch. In the right posterior lobe of the cerebrum was a small mass of the size of a pea, and around it the brain-substance was softened. In the right corpus striatum were two similar tumors. The heart was normal.[1]

Of the sixteen cases without cavities, pleurisy with effusion existed in five. The facts noted in these five cases, severally, are as follows:—

Case 1. The left pleural cavity contained three pints of sero-lymph. In the compressed right lung were numerous miliary tubercles. The right pleural surfaces were universally adherent, and the right lung was crammed with miliary tubercles. There was no cavity nor any exudation. The heart was normal. The liver was enlarged. The peritoneal cavity contained several quarts of serum. In the stomach was a round ulcer two lines in diameter. There were numerous ulcers in the small intestine, with raised edges, and the contiguous membrane was thickened and reddened. The mesenteric glands were much enlarged and caseous.

Case 2. Old pleuritic adhesions existed everywhere in the left side. The left lung was crammed with tubercles of the size of millet seeds, some of which were hard and some softened. The upper part was solidified by the aggregation, without coalescence, of tubercles. In the right pleural cavity there was a pint of sero-lymph. The right lung contained a few miliary tubercles. The bronchial glands were enlarged. The heart was normal. The liver was fatty. There were some peritoneal adhesions. In the ileum, a few inches above the cæcum, there was an ulcerated patch, and the mesenteric glands were enlarged.

Case 3. Both pleural cavities contained a considerable quantity of turbid serum with a very little lymph. No affection of lungs except, on close inspection, granulations of the size of pins' heads were found between the lobes beneath the pleura. The surface of the peritoneum was studded with granulations of the size of pins' heads. Bronchocele existed in this case.

Case 4. Double pleurisy, with considerable effusion in both sides, existed in this case. On the right side the lung was adherent from the summit to the fourth rib, and the space below was filled with liquid. A bridle of membrane only existed on the left side, and the liquid effusion was larger than on the right side. In both sides the liquid was turbid and contained flakes of lymph. The lungs were studded with tubercles, none being larger than pins' heads. They were most abundant on the right side. The heart was small. The pericardial surfaces were roughened, and the cavity of the pericardium contained three or four ounces of turbid liquid.

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[1] Copied from the Bellevue Hospital Dead-House Record.

Case 5. The left pleural cavity contained a large quantity of liquid. The lower lobe was compressed into a small solid mass. The upper lobe was solidified by exudation of a cheesy consistence. Over this lobe the pleural surfaces were strongly adherent. The lower lobe was studded with miliary tubercles of the size of pins' heads. The whole of the right lung was crammed with hard opaque tubercles. There was no pleuritic effusion on this side. There were no tubercles in the liver. The kidneys were normal. There was no pericarditis.

Of the sixteen cases without cavities, in one case recent pericarditis existed. In this case there were several nodules at the summit of the right lung, their size varying from that of a bean to a pigeon's egg. The left lung contained some small nodules.

In one of the sixteen cases acute pneumonia existed. At the apex of the left lung there were a few miliary tubercles; otherwise this lung was healthy. The right lung was everywhere agglutinated to the walls of the chest by recent lymph. At the apex of this lung there were solidification and softening, but no cavity. The entire lung below was in the second stage of pneumonia. The heart was enlarged, weighing sixteen ounces. The enlargement was due to hypertrophy of the walls of the left ventricle. The cavity of this ventricle contained coagula, a portion of which was white and the remainder black. A mass of fibrin extended into the aorta. The cavity of the right ventricle was filled with colorless fibrin firmly agglutinated to the ventricular walls and closely intertwined with the tendinous cords. Projections extended into the auricle and into the pulmonary artery; these were grooved. The aortic valves were thickened, and the segments were rigid from calcification. The mitral valve was sufficient. The weight of the left lung was 15½ ounces. The right lung weighed 49 ounces.

In one of the sixteen cases the upper lobe of the right lung was solidified by miliary tubercles, and near the apex there was a collection of liquefied morbid products, but no cavity. There were nodules in the lower lobe of this lung. The left lung contained a few nodules. The heart was normal. The lower part of the ileum presented numerous small bodies, in the sites of Peyer's and the solitary glands, some containing a liquefied, and others a cheesy, matter. The mesenteric glands were enlarged and cheesy. The liver, kidneys, spleen, stomach, and brain presented nothing abnormal.

In another of the sixteen cases, it is noted that both lungs contained tubercles with interstitial pneumonia, and several collections of liquefied morbid products. In this case there were ulcerations in the ileum with enlargement of the mesenteric glands.

In one of the sixteen cases death was the result of accidental poisoning with the tincture of aconite. At the anterior portion of the summit of the right lung there was a nodule of the size of a hazel-nut and no other evidence of phthisis. This case was one of much interest from the fact that the small affection had been diagnosticated by means of physical signs. The case will be referred to in connection with the studies relating to the physical signs and diagnosis.

In the last one of the sixteen cases without cavities, the *post-mortem* examination showed appearances which, taken in connection with the past history, were considered as resulting from disease eighteen years before death. Near the summit of each lung was an encysted mass of about the size of a hen's egg. A section showed condensed tissue with an abundance of disseminated calcareous particles. The two masses were similar as regards their constituents, and nearly so as regards size, the one in the right lung being a little larger than the other. Each extended nearly to the anterior surface of the lung, and at its site the lung was depressed and puckered. The patient was a manufacturer of burr mill-stones, and had formerly himself worked in making them. While so occupied he had a cough which continued, with other symptoms, until he felt obliged to give up personal labor in his business. This was eighteen years before his death. He soon recovered his health, and had been well up to about two months before his death.

In addition to the appearances just described, there were the following which denoted the recent fatal disease: On the right side the pleural surfaces were universally adherent, the adhesions being tender. Partial adhesions existed on the left side. The right lung contained an abundance of miliary tubercles, with exudation, and a few collections of liquefied morbid products. The left lung contained miliary tubercles in great abundance, without either infiltration, liquefied products, or cavity. Other organs were not examined.

The very small proportion of the fatal cases in which cavities in the lungs are not found after death is a noteworthy fact. The formation of cavities does not enter into the morbid anatomy of acute miliary tuberculosis; and, of the foregoing sixteen cases, five are to be distinguished as cases of this disease. Eliminating these five cases, of the eleven remaining cases, in one case the death was from poisoning, and had nothing to do with the slight tuberculous affection. Ten cases remain. Of these ten cases, in three there were collections of liquid which would soon have eventuated in cavities. In two of these three cases disease of the small intestine and of the mesenteric glands existed, and in the other case one lung was crammed with miliary tubercles. In one case death was attributable to acute lobar pneumonia and heart-clot. In one case acute pericarditis was the cause of death. In five cases death was measurably referable to coexisting pleurisy with effusion, the pleurisy being double in two cases, and in two cases disease of the intestine being superadded. A conclusion to be drawn from an analysis of these cases is, that when chronic phthisis proves fatal it almost invariably leads to the formation of cavities, if life be not destroyed by some complication or intercurrent affection such as pleurisy with effusion, pneumonia, pericarditis, and intestinal disease.

I am led now to inquire whether my notes relating to the morbid anatomy furnish anything which may shed light on a pathological question long mooted, and concerning which opposite opinions are held, namely, the relationship existing between the gray granulations and the so-called tuberculous exudation or infiltration.[1] Of these two forms of disease, so often associated, which, if either, is antecedent to the other, and have they a causative connection with each other? In other words, do the granulations precede and give rise to what has been known as tuberculous infiltration, or, on the other hand, are the former secondary to, and dependent on, an infection derived from the metamorphosis of cheesy morbid products in the lungs or elsewhere? It is difficult to answer this question otherwise than by conjecture. It is a reasonable supposition that granulations precede and determine the occurrence of the exudation (which doubtless consists of inflammatory products) within the air cells, the ulterior results being softening, liquefaction, and cavities. When these products and results are found after death without the presence of either granulations or miliary tubercles, it may be reasonably supposed that the latter have existed and been lost by being merged in the lesions to which they give rise. It is a fact militating somewhat against this conjecture, that, in cases of acute tuberculosis, granulations exist in immense numbers without the occurrence of exudation within the air-cells. Moreover, as in some of the cases which have been cited already, exudation and liquefied products may exist in one lung, the other lung being crammed with granulations or miliary tubercles without either exudation, liquefied products, or cavity. The other conjecture, namely, that granulations are secondary to, and dependent on, cheesy degeneration of morbid products either in the lungs or in some other part of the body, requires, of course, a constant coexistence of the latter with the former. In the cases of acute tuberculosis, the granulations, which accumulate in the lungs sufficiently to cause apnœa, must, according to this conjecture, depend on an infection from morbid products elsewhere than in the pulmonary organs. Granting that the latter are not found, there is always room for the supposition of their being in some part of the body not examined with sufficient minuteness, or it may be supposed that they have existed and disappeared before death. But in the cases in which morbid

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[1] I use the term exudation to denote what has been known heretofore as infiltrated tubercle or crude tubercle, the anatomical condition, according to late writers, of tuberculous, cheesy or catarrhal pneumonia; in other words, the intra-vesicular product causing the solidification in phthisis, when this solidification is not due to interstitial pneumonia or hyperplasia of the fibroid tissue. I

use the expression "liquefied morbid products" to denote this exudation liquefied, considered heretofore as liquefied tuberculous matter, and constituting so-called tuberculous abscesses, the evacuation of this matter leaving cavities. I use these terms on account of their not involving any pathological views respecting the character of the exudation or products. I suppose, however, as I have stated, the exudation to be the result of an inflammatory process.

products are found either in the lungs or elsewhere, what proof is there that they are antecedent to, and causative of, the granulations, instead of being secondary to the latter either as effects of a common underlying cachexia, or associated merely by coincidence!

An analysis of my cases may shed some light on the relationship between the gray granulations or miliary tubercules and the exudation which has been known as tuberculous infiltration, regarded in one point of view, namely, the importance of the former when they are associated with the latter. Some of the late writers who follow Virchow in limiting the application of the term tubercle to the gray granulations, and apply the term pneumonia to the intra-vesicular products, that is, to the so-called tuberculous infiltration, seem to consider the former as the graver element, when these two forms of disease are associated. Niemeyer gives expression to this opinion when he says, that he has "no hesitation in saying that the greatest danger for the majority of consumptives is, *that they are apt to become tuberculous.*" With reference to this opinion I propose to analyze my notes of the morbid anatomy in regard to the inquiry, how often and to what extent is it fair to attribute importance to granulations or miliary tubercles when associated with either exudation, liquefied morbid products, or cavities.

I exclude from the cases embraced in this analysis those which are distinctly cases of acute tuberculosis, and also the cases in which perforation of lung occurred. Excluding these, the number remaining is *sixty-three.* Of these 63 cases, in 33 neither the presence nor the absence of either gray granulations or miliary tubercles is noted. Undoubtedly they were present in the great majority of these 33 cases; but it is certain, that, if they had been present in great abundance, the fact would have been noted. It seems a fair inference that in these cases they were not present in sufficient number to interfere much with the function of respiration; and, aside from the conjecture that they give rise to the so-called tuberculous infiltration, by exciting pneumonic inflammation, their local importance must depend on their compromising the functional capacity of the lungs—an effect which must be proportionate to their abundance. The conclusion, then, is that, in these 33 cases, their importance, whenever they were present, was inconsiderable.

Exclusive of these 33 cases, there remain 30. Now, of these 30 cases, in 4 the absence of granulations and miliary tubercles was noted. Of course, these 4 cases are to be excluded. The remaining 26 cases are of especial interest with reference to the question under consideration. Analyzing these 26 cases, I find that in 10, granulations or miliary tubercles coexisted with great destruction of the pulmonary structure as denoted by solidification, liquefied products, or cavities. A succinct statement of the facts in these 10 cases, generally, will occupy but a little space.

Case 1. Cavities in both lungs; very large in the right lung. Some pleuritic effusion. The left lung studded with granulations or miliary tubercles.

Case 2. Several cavities in both lungs. An entire lobe solidified by exudation. Extensive exudation in other lobes. Nodules of extravasation (pulmonary apoplexy). Numerous granulations in the lower lobe of the left lung.

Case 3. A large cavity. No exudation nor interstitial pneumonia. Numerous tubercles from the size of a pin's head to a pea.

Case 4. Cavities in both lungs. No exudation. Both lungs crammed with cheesy tubercles of the size of a pin's head.

Case 5. Large cavity in each lung. Lobular emphysema. Numerous tubercles, none larger than a pea.

Case 6. Large and small cavities. Extensive solidification from exudation. Collections of liquefied products. A few small tubercles in the upper lobe of right lung.

Case 7. Large cavity and numerous small cavities in each lung. Interstitial pneumonia. Interstitial ulcerations. Disseminated tubercles.

Case 8. A large cavity in one, and a small cavity in the other, lung. Disseminated tubercles without exudation or collections of liquid products.

Case 9. An entire lung converted into a series of cavities. Small yellow nodules here and there in the other lung.

Case 10. Abundant miliary tubercles with cavities, and collections of liquefied products.

The number of granulations or of miliary tubercles in these 10 cases was not noted with as much precision as is desirable with reference to the question under consideration. Judging, as far as practicable, of their abundance, together with the amount of damage from the associated morbid conditions, they were sufficient to be of considerable importance in 5 cases, namely, Nos. 3, 4, 5, 8, and 10. On the other hand, they seem not to have been of much importance in 5 cases, namely, Nos. 1, 2, 6, 7, and 9.

In 11 cases either granulations or miliary tubercles existed, in more or less abundance, without great injury from associated morbid conditions. I will give a condensed abstract of the morbid anatomy in these 11 cases.

Case 1. Both lungs crammed. Several small cavities.

Case 2. A small cavity in one lung, and the remainder of this lung so much crammed that it resembled the roe of fishes. Appearances in the other lung not noted.

Case 3. A few cavities and a few granulations. The latter existed in other organs. Intestinal ulcerations and perforation.

Case 4. Few cavities in lower lobe. Bronchial glands enlarged and cheesy. Both lungs crammed with tubercles.

Case 5. Double pleurisy with effusion. Lungs studded with granulations without infiltration, abscess, or cavity.

Case 6. Pleuritic effusion in left side. The upper lobe solidified by infiltration. Lower lobe studded with granulations. Right lung crammed with tubercles.

Case 7. Upper lobe of right lung crammed. It contained liquefied products and nodules, but no cavity. Granulations elsewhere than in this lobe not noted. Intestinal ulcerations and disease of mesenteric glands.

Case 8. A small cavity. Disseminated tubercles. Intestinal ulcerations and disease of mesenteric glands. Ulcers in larynx and trachea.

Case 9. Small cavity in right lung. Disseminated tubercles varying in size from that of pins' heads to peas. Interstitial pneumonia at apex of left lung, and a few tubercles. Intestinal ulcerations.

Case 10. Cavity at apex of left lung of the size of an English walnut. Lobular emphysema. Both lungs crammed.

Case 11. A cavity at the apex of right lung, and a few tubercles. The left lung healthy. Intestinal ulcerations and peritonitis.

Estimating as fairly as practicable the importance of the coexisting granulations or miliary tubercles—that is, their agency in determining the fatal result, the estimate being based on their abundance, on the one hand, and, on the other hand, on the gravity of complications, such as pleuritic effusion, intestinal ulcers, and peritonitis, the latter taken in connection with the condition of the lungs aside from the presence of the granulations or miliary tubercles—the conclusion is as follows:—

The granulations or miliary tubercles were of considerable or great importance in seven, and of comparatively small importance in four, of the eleven cases.

In five cases, not included in the two groups of 10 and 11 cases just analyzed, the lung on one side contained granulations or miliary tubercles in more or less abundance, without other morbid conditions on that side, the other lung presenting exudation, liquefied products, or cavities. The facts noted in these five cases are as follows:—

Case 1. In the right lung exudation and liquefied products, but no cavity. The left lung crammed with granulations.

Case 2. A large cavity and exudation on one side. The upper lobe of the other lung crammed, and in this lung neither exudation, liquefied products, nor cavity.

Case 3. A few miliary tubercles at the summit of the left lung; otherwise this lung healthy. The right lung presented exudation and liquefied products. Acute lobar pneumonia also existed, and there was enlargement of the heart with valvular lesions.

Case 4. A cavity at the apex of the left lung, and the greater part of this lung was solidified by exudation; miliary tubercles were scattered throughout the right lung.

Case 5. A cavity in the left lung and much exudation. Discrete small tubercles in the right lung.

Of these five cases, the granulations or miliary tubercles appear to have been of considerable importance in two—namely, Nos. 1 and 2; and of comparatively small importance in three—namely, Nos. 3, 4, and 5.

Summing up the results of the foregoing analyses of the twenty-six cases in which the record of the *post-mortem* examinations embrace some account of granulations or miliary tubercles, coexisting with more or less damage of the pulmonary organs from exudation, liquefied products, cavities, and fibroid solidification or interstitial pneumonia, together with, in some of the cases, pleuritic effusion, intestinal ulcerations, etc., it seems fair to attribute to the granulations or miliary tubercles considerable or great importance in fourteen cases, in the remaining twelve cases their importance being comparatively small. In connection with these results, it is to be borne in mind that in thirty-two cases the existence of granulations or miliary tubercles was not noted, the inference being that, when present in these cases, they did not exist in sufficient abundance to be of much importance.

With reference to the question with which I premised the analyses—namely, How often and to what extent is it fair to attribute importance to granulations or miliary tubercles when they are found in connection with exudation, liquefied products, and cavities?—the conclusions to be drawn from the facts which have been presented are as follows: They are sufficiently abundant to be of considerable or great importance in a certain proportion of cases. How large this proportion is, the data which my cases furnish are inadequate to determine with precision; but it is certain that the proportion is less than that of the cases in which their importance is comparatively small. The statement, therefore, which has been given—namely, "the greatest danger for the majority of consumptives is *that they are apt to become tuberculous*," the term tuberculous, in this quotation, being limited to granulations or miliary tubercles—is not warranted by facts. Evidently the greatest danger for the majority of consumptives relates to the amount of injury of the pulmonary structure from exudation, liquefied morbid products, cavities, interstitial pneumonia, and lobular emphysema, together with pleuritic effusions, perforation of lung and pneumo-hydrothorax, intestinal ulcers, enlarged mesenteric glands, peritonitis, and other intercurrent affections. In a small proportion of cases the coexisting granulations or miliary tubercles are so abundant that it is reasonable to consider acute tuberculosis as having been superadded to the chronic disease. But it does by no means follow that the cramming of the lungs with granulations or miliary tubercles is in consequence of an infection derived from the antecedent pulmonary disease. Opposed to this conclusion is the fact that, in some cases in which the lungs were crammed with miliary tubercles or granulations, cavities existed without either exudation or liquefied products, evidently denoting an antecedent affection of old date; whereas the miliary tubercles or granulations denote a recent affection. The interval goes to show the absence of any causative connection between the recent affection and the disease which led to the cavities.

Perforation of lung, giving rise to pleurisy and pneumothorax, occurred in 12 out of the 84 cases in which *post-mortem* appearances were noted. It would be an error to assume this proportion of cases (14½⅟ per cent.) as the ratio in which perforation may be expected to take place, for a particular interest was felt in recording and examining after death cases characterized by the occurrence of this accident. It will be considered with reference to symptoms, signs, duration of life, etc., in another chapter. A few points only relating to the morbid anatomy will be here stated.

Of the twelve cases, in one case it is not noted whether the perforation was in the right or the left lung. Of the remaining eleven cases, it occurred in the left lung in six, and in five in the right lung.

In only one case is it noted that the site of the perforation was in the lower lobe. The perforation, in all the cases, was from within outward. The quantity of liquid in the pleural sac varied much in the different cases. In all the cases the pleural surfaces were more or less coated with lymph. It is noted only in one case that the air escaping when the chest was opened was fetid, and in this case it was slightly so. It is noted in three cases that the liquid was purulent, and in one case that it was puruloid; in the other cases its characters were those of sero-lymph. Finally, the cases presented much diversity as regards the number and size of pulmonary cavities, the amount of exudation, the number of granulations or miliary tubercles, and the presence of the latter in other organs. With reference to these points it does not seem desirable to introduce details.

In two of the cases there was the evidence of recent pericarditis. And in another case the pericardial cavity was obliterated by old adhesions. One of the kidneys was tuberculous in two cases, and in one case both the kidneys were affected.

An analysis of these cases with reference to the coexistence of pulmonary or vesicular emphysema, gives results corroborating certain facts already sufficiently established:—

First. In several cases it is noted that lobular emphysema existed; that is, portions of lung between phthisical nodules or masses, were emphysematous. The number and size of these emphysematous portions varied in different cases. Doubtless they existed in some cases in which their existence was not noted; for, as is well known, they are quite common. They are doubtless secondary to the phthisical affection, whatever opinion may be adopted as to the mechanism of their production. This secondary lobular emphysema serves to account for the increased or vesiculo-tympanitic resonance on percussion, in certain cases, over lung more or less solidified by exudation.

Second. In only two cases was there lobar emphysema; and in neither of these cases was it certain that the emphysema preceded the phthisical disease. The analysis thus goes to show the extreme infrequency of the association of lobar emphysema with phthisis, and to confirm the fact that a protective influence against this disease belongs to emphysema. The latter fact is a logical inference from the infrequency of the association, and the frequency with which emphysema exists independently of phthisis.

The appearances in the two cases just referred to were as follows:—

Case 1. The upper and lower lobes of both lungs were emphysematous. Their volume was increased. They were dry and downy to the touch, and the air cells were visible to the naked eye. At the summit of each lung was an anfractuous cavity of the size of a large orange. Both lungs contained numerous small tubercles, none being larger than a pea, and there were no cavities except the two stated.

The probable supposition is that, in this case, the emphysema was secondary to the phthisical affection which led to the large cavities.

Case 2. The volume of each lung was large, and the surface of all the lobes presented thickly set emphysematous portions. On section, the divided surfaces were studded with granulations. At the apex of the left lung was a cavity of the size of an English walnut. The bronchial mucous membrane was deeply reddened as far as the branches could be traced.

In this case, too, it is, perhaps, a probable supposition that phthisis, as represented by the cavity, existed prior to the emphysema. The granulations, with which the lungs were crammed, probably denoted a recent affection; in other words, acute tuberculosis became developed. Possibly the emphysema was secondary to the latter.

In one case the variety of emphysema distinguished as atrophic existed in a marked degree. The right lung, in this case, presented a series of cavities in the upper third, two being quite large. There was no exudation in this section. One of the cavities contained a cheesy mass as large as a bean. Below these cavities within a space as large as an orange there was red hepatization. A few nodules existed in the lower part of this lung. The upper lobe of the right lung presented numerous projecting air blebs from the size of a pea to that of a walnut —several were as large as the latter. They contained shreds of pulmonary structure, and in one were small masses of dried blood. The volume of this lobe was considerably diminished. A few nodules existed in the left lung, and no cavities.

In another case there was notable emphysema of the upper and middle lobe, and, also, of the upper part of the lower lobe of the right lung. Small tubercles and a few nodules were scattered through this lung. The left lung was much contracted, and presented a series of communicating cavities extending from the apex nearly to the base, the two lobes being closely united together, and the whole lung closely adherent to the thoracic wall.

In addition to what has been presented in the foregoing pages, the following enter into the morbid anatomy of phthisis: Pleuritic adhesions, fibroid induration or interstitial pneumonia, enlargement of bronchial glands, extravasation of blood or pulmonary apoplexy, gangrene, dilatation of bronchial tubes, diminished volume of a lobe or of lobes, and circumscribed congestion. Some notice of this group will conclude my account of the morbid anatomy of the pulmonary organs.

The absence of pleuritic adhesions (exclusive of the cases of pleurisy with effusion) in either one lung or in both lungs, is noted in only four cases. In most of the other cases it is noted that there were adhesions, either universal or more or less extensive. The facts in these four cases are as follows: In one case the left lung was free from adhesions. This lung contained a cavity of the size of a hickory nut, and the whole of this lung was a mass of tubercles with several collections of liquefied products. In another case adhesions existed on the left, but none on the right, side. The right lung contained several small cavities and patches of solidification. The disease was more extensive and advanced in the left lung. This case will presently be cited as exemplifying the coexistence of pulmonary apoplexy with phthisis. In another case there were no adhesions on either side, both lungs being crammed with tubercles not larger than pins' heads. Tubercles also existed in other organs. In the remaining case the left lung was free from adhesions. At the apex of this lung was a cavity of the size of a peanut, together with disseminated tubercles. In this case there were calcareous plates beneath the pleura on both sides, irregular in shape, of the size of the palm of the hand, and one-eighth of an inch in thickness. They came away on tearing off the costal pleura.

These facts illustrate the great infrequency of the exceptions to the rule that pleuritic adhesions accompany phthisis. The occurrence of pleurisy as secondary to, and an effect of, phthisis, was beautifully exemplified in one of the cases of pneumothorax. The perforation was on the right side. The left pleural cavity contained a pint of sero-lymph, and numerous miliary tubercles were beneath the pleura on this side. On the site of each tubercle was a small tuft of lymph.

Fibroid solidification, or interstitial pneumonia, varying much in extent and in the degree of hardness, is noted in a considerable number of cases. Frequently around cavities and in the spaces between nodules or collections of liquefied morbid products, the pulmonary structure was indurated. In some cases this change was marked both in extent and degree. For example, in one case it is noted as follows: "Left lung much diminished in volume. Everywhere it was adherent. The upper part was condensed and solid, cutting like cartilage. The lower part contained a few isolated tubercles. The right lung had isolated tubercles from the size of a pin's head to a pea, and at the apex was a small cavity." Without introducing further details, an examination of my notes with reference to this incidental change, shows it to be important as one of the damaging morbid conditions in cases of phthisis. Moreover, it is to be reckoned as a condition giving rise to the signs of solidification, and as inducing contraction of the volume of the lung. On the other hand, it may be sometimes conservative by encapsulating masses of exudation, and by affording a protection against the rupture of collections of liquefied products into the pleural sac.

In the notes of many cases it is stated that the bronchial glands were enlarged, their structure being sometimes firm, and sometimes of cheesy consistence. This is so common in cases of phthisis, that I am sure there was enlargement of these glands in more or less of the cases in which the fact was not noted. The liquefaction and discharge of the morbid product within the glands into the bronchial tubes or into the pleural sac was not observed in any case. An effect, however, noted in one case, is of importance as explaining a result of the physical examination of the chest which I have repeatedly observed, and to which I shall refer in connection with the physical signs and diagnosis, namely, obstruction by pressure on one of the primary bronchi. In the case referred to, the bronchial glands were greatly enlarged, and one of them was so situated as to press upon and diminish considerably the calibre of the right primary bronchus.

Extravasation of blood, or pulmonary apoplexy, was noted in one case. In this case there were old adhesions at the summit of the left lung, and none on the right side. At the left apex was a cavity of the size of an English walnut, and in its vicinity were several smaller cavities. A considerable portion of the upper lobe of this lung was solidified by exudation. In the lower lobe were numerous granulations with some small exudation nodules and cavities. An apoplectic nodule of the size of an English walnut existed in the upper lobe of this lung, together with several smaller nodules. In the right lung were patches of exudation and some small cavities. A considerable portion of the middle lobe of this lung was infiltrated with blood, and the bronchial tubes on this side contained fluid blood. The condition of the heart was not noted. Death took place suddenly, and was preceded by hemoptysis. The patient was a colored woman, and she had been beaten by her husband shortly before death. A coroner's inquest was held, and the autopsy was made in order to determine whether the death was occasioned by the beating.

Pulmonary gangrene was noted in one case. In this case, at the apex of the right lung was an old tuberculous cavity, with ridges and a broken band of condensed tissue of the size of a pipe-stem. Connected with this cavity was a mass of gangrenous lung in the process of sloughing. The surrounding tissue presented no evidence of inflammation, and no exudation. At the anterior portion of the lower lobe of the left lung, within a circumscribed space of the size of an orange, the tissue was dark and friable. A portion of this was diffluent, and had a gangrenous odor. The adjacent parts were free from tubercles or exudation, and gave no appearance of inflammation.

The facts with respect to the size of the bronchial tubes were in most cases not noted. Cavities were not always examined with sufficient care to discriminate those which were truly phthisical from those caused by saccular enlargement of the tubes. With reference to dilatation of the tubes, my notes are extremely meagre. I shall content myself with citing, under this head, the appearances in one case. In this case there were old and strong adhesions on both sides. A small triangular, solid mass, about two inches in width and length, represented the lower lobe of the left lung. This lobe was in the condition of atelectasis. The upper lobe was very contracted and crammed with miliary tubercles, without exudation or cavity. The bronchial tubes of this lobe were moderately dilated. The left primary bronchus was one-third larger than the right. Numerous miliary tubercles were in the upper lobe of the right lung, and there were a few in the lower lobe. The heart was moderately enlarged without valvular lesions.

Diminution of the volume of parts affected with phthisis was observed in many cases. A case has been already cited in which there was so much contraction of the right lung as a result of excavation and interstitial pneumonia, that the heart was displaced to the right of the sternum, this effect occurring while the patient was under observation.[1] I have observed this in several cases, the notes of which do not embrace post-mortem examinations. On the left side, the diminished volume of the upper lobe, in some cases, led to the heart being in contact with the walls of the chest over a larger space than in health. This result will explain abnormal impulses in the pericordia referable to the heart, the aorta, and the pulmonary artery, which will be noticed in the chapter devoted to the physical signs.

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[1] See page 23.

In one case the appearances were interesting when taken in connection with the occurrence of profuse hemoptysis shortly before death. Both lungs, in this case, contained disseminated nodules, and a few small cavities. The middle lobe of the right lung was deeply congested, in this respect being in striking contrast with the remainder of the lung. The mucus in the bronchial tubes of this lung was tinged with blood. There was no blood in the bronchial tubes of the other lung. Hence was inferred a connection between the copious hemorrhage and the congestion of the middle lobe of the right lung.

In one of the cases which has been introduced (*vide* page 26) the appearances denoted the second stage of lobar pneumonia. In connection with the physical signs and diagnosis in another chapter, I shall refer to the occasional occurrence of circumscribed acute pneumonia as an intercurrent affection. In one case the appearances denoted such an occurrence. In this case the upper lobe of the right lung presented two large cavities, and below these a portion of the lung of the size of an orange, was in the state of red hepatization.

The study of my cases with reference to morbid appearances elsewhere than in the lungs will be of very little, if any, use in determining numerically the proportion in which different parts of the body are diseased. The reasons for this have been already stated, to wit, in many cases the morbid appearances in the lungs only are noted, these organs being alone examined in not a few of these cases. The notes not having been made with a view to such a numerical analysis, the negative facts, that is, the normal condition of the different parts, were not ascertained, or, if ascertained, they were not recorded. I must limit myself to some account of the morbid appearances, elsewhere than in the lungs, in the cases in which they were observed and noted. Moreover, these appearances, as well as those relating to the lungs, were not studied histologically, that is, by means of the microscope. The parts presenting morbid appearances which were noted are the following: The heart, the larynx, and trachea, the intestines, the mesenteric glands, the stomach, the peritoneum, the liver, spleen, and kidneys, the iliac veins, and the brain. I proceed to notice briefly the morbid appearances in these different parts.

The small number of cases in which lesions of the heart were noted, is evidence of the absence of causative relations, reciprocally, between disease of this organ and phthisis.

Morbid changes in the heart were noted in only ten cases. In fourteen cases it is noted that the heart was normal; and, as this organ must have been examined in nearly all the cases, it is fair to conclude that there were no morbid appearances worthy of note whenever the histories are silent with respect to this point. Even in the ten cases in which lesions were noted, the circumstances go to show that their association with the tuberculous affection was accidental.

In five cases there was enlargement of the heart. The enlargement was moderate in all these cases, the weight in the case in which the enlargement was greatest being 16 ounces. In one of these cases the enlargement was confined to the right side of the heart, and in this case atrophic emphysema of the left lung existed in a marked degree, the right lung having several large phthisical cavities. There were no valvular lesions, and, evidently, in this case, the enlargement was dependent on the emphysema. In another case the volume of the left lung was diminished, and the lower lobe was collapsed. There was dilatation of the bronchial tubes. Miliary tubercles, without cavity or exudation, existed in this case. There were no valvular lesions. In another case the enlargement was slight, and the organ was fatty, without valvular lesions. There was pneumohydrothorax in this case. In the case in which the enlargement was greatest, it was limited to the left ventricle, and there were aortic lesions. In the remaining case, lesions of the valves were not noted, and there was evidence of recent pericarditis. It is quite certain that in all these cases the enlargement had nothing to do with the phthisis either as a cause or an effect.

I have noted in only one case that the heart was diminished in size. More or less atrophy of this organ is a well-known concomitant of phthisis, but the facts with reference to this point were not embraced in the records.

In four cases recent pericarditis is noted. In two of these four cases, perforation of lung and pneumo-hydrothorax existed. The perforation in both cases was of the right lung. In one of these two cases, pleurisy with effusion existed in the left side; and in this case the kidneys were the seat of tuberculous disease. Of the remaining two cases, in one case there was double pleurisy with effusion in both sides. The pericardial surfaces were universally adherent in a case not included in the four cases, the record not stating whether the pericarditis was, or was not, recent. In this case there was perforation of the left lung with pneumo-hydrothorax. The appearances in all these cases were not studied with reference to the question whether there was evidence of tuberculous disease of the pericardium. The coexistence of pleurisy with effusion in four of the five cases, and of pneumo-hydrothorax with perforation in three cases, are noteworthy facts.

Fatty degeneration of the heart was noted in two cases, in one of which there was also enlargement.

Morbid appearances in the larynx and trachea were noted in five cases. Of course, these portions of the respiratory apparatus must have been the seat of lesions in other cases. The appearances noted may be of interest as illustrative of the different morbid changes which are observed in connection with phthisis. In one case the membrane above the inferior vocal chords was thickened and granulated, with some ulcerations. In one case the trachea presented numerous small round ulcers, looking as if portions of the membrane had been removed with a punch, over the vocal chords the membrane being thickened but not ulcerated. In one case the superior chords were destroyed, the appearance being that of erosion, without raised edges or redness. In one case the vocal chords were thickened, and on each side was a burrowing ulcer without redness. In the remaining case, the trachea and larynx were covered with a lymph-like exudation, which had exfoliated at numerous small points, giving the appearance of minute ulcers. A small ulcer existed just below the left inferior vocal chord.

Intestinal ulceration is noted in eleven cases. The only ulcers described were in the small intestine in all but three of these twelve cases. Generally they were described as present only in the lower part of the small intestine; and wherever the records contain information on this point, their situation was in either Peyer's or the solitary glands. Whenever the characters of the ulcers are described, it is stated that the borders were raised and hard, the adjacent membrane being generally thickened and reddened. There was much variation in the different cases, as regards the number, size, and depth of the ulcers. In one case it is noted that there were extensive ulcerations from the stomach to the colon; that some of the ulcers formed zones from one-half to one-third of an inch in width, encircling the intestinal canal, and that at some points nothing remained but the serous coat. Perforation had occurred in this case, and the immediate cause of death was peritonitis. On the other hand, in some cases the ulcers were few in number, and in two cases there was only a single ulcerated patch. They were also, in some cases, small and superficial. In three cases ulcers are described as existing in the large, as well as in the small, intestine. In one of these cases, diphtheritic exudation, as well as ulcers, existed. In another case there were ulcers in the cæcum. In the remaining case numerous large and irregular ulcers were in the colon and rectum; perforation had taken place, and there were the anatomical characters of peritonitis. The ulcers in the small intestine were few and situated at the lower part of the ileum.

In one case, not included in the foregoing group, the following appearances were noted: At the lower part of the ileum in situations corresponding to Peyer's and the solitary glands, were numerous projecting bodies of the size of small peas. Some of these contained a liquid, and others a white cheesy matter. The surrounding membrane was not thickened nor reddened.

In all these cases, save one case, it is noted that the mesenteric glands were more or less enlarged. In the history of one case in which there were intestinal ulcers, the mesenteric glands are not mentioned. In no case is it noted that, with intestinal ulcers, the mesenteric glands were healthy. These glands were somewhat enlarged in one case in which there were no ulcers in the intestine. It is noted in several cases that the enlarged glands were softened and cheesy. In one case they were enlarged to the size of an American walnut.

The existence of recent diffused peritonitis is noted in two cases; and in these cases it was due to perforation of the intestine, the perforation taking place in one case in the small, and in the other case in the large, intestine. Peritoneal adhesions were noted in a case in which there was an ulcerated patch just above the cæcum with enlargement of the mesenteric glands. It is probable that chronic peritonitis existed in some cases in which either the abdomen was not examined, or the appearances here were not noted. Its existence would doubtless have been ascertained and recorded in the cases in which either ulceration in the intestines, or enlargement of the mesenteric glands was noted; and, hence, it is a fair inference that intestinal ulcers and enlargement of the mesenteric glands are not apt to give rise to peritonitis, excepting cases of perforation. Granulations situated in the peritoneum, without peritonitis, were noted in several cases in which intestinal ulcers were not found. Generally in these cases tubercles existed in various situations, and granulations or miliary tubercles existed in the lungs without exudation or cavities.

The appearances in the stomach are not noted in many cases. In one case there was a round ulcer two lines in diameter, numerous intestinal ulcers existing in this case. My notes are barren as regards a highly interesting and important topic relating to the alimentary canal, namely, the occurrence of degeneration of the gastro-intestinal tubules.

Fatty liver was noted in seven cases. In all these cases the amount of fatty deposit was marked, and their small number is not to be considered as representing the proportion of cases of phthisis in which this marked change exists in a greater or less degree. In four of the seven cases the liver was enlarged, and in one of the cases the enlargement is noted as enormous. The liver was notably lardaceous or waxy in one case, this change also existing in the spleen and in the kidneys. In this case the change was marked. Existing in a moderate or slight degree, it would very likely have been overlooked or not been noted. The liver in several cases was studded with granulations, which were sometimes disseminated throughout the organ.

The spleen was notably lardaceous or waxy in one case, together with the liver and the kidneys. It was crammed with miliary tubercles, together with small cheesy collections in one case, the lungs being crammed with tubercles without exudation or cavity, tubercles also existing in the liver and peritoneum. In another case there were a few tubercles in the spleen ; and in this case only miliary tubercles were in the lungs, the liver, kidneys, and brain being also the seat of tuberculous disease.

Of thirteen cases in which the appearances of the kidneys were noted, they were normal in six. They were lardaceous or waxy in one case, the liver and spleen being in the same condition. They were noted as fatty, together with the liver, in one of these cases. In two cases they exemplified the variety of disease known as the large white kidney. In one of these two cases there was only a single small nodule in the lungs, the patient's life being lost by accidental poisoning. In the other case the lung on one side was extensively diseased, the volume being much diminished from cavities and interstitial pneumonia. In three cases the appearances denoted tuberculous disease of the kidney. In one of these cases it is simply noted that there were some tubercles in the kidneys. There were miliary tubercles in the lungs in this case, and also in the spleen ; ulceration of the small intestine existed, with enlargement of the mesenteric glands, and tuberculous disease of the brain. In another of the three cases there was pneumo-hydrothorax from perforation ; there were tubercles in the peritoneum, and pericarditis existed. In this case the left kidney presented tuberculous exudation with slight pyelitis, and there were a few tuberculous masses in the right kidney. Pneumo-hydrothorax from perforation also existed in the remaining case, both lungs being extensively diseased. The liver was fatty. In this case the left kidney was the seat of extensive disease, cheesy masses and puruloid matter occupying nearly all the substance of the organ. The right kidney presented a normal appearance. The infrequency of the association of pulmonary tuberculosis with Bright's disease of the kidney will be considered in another chapter under the head of complications.

Obstruction of the iliac veins from thrombosis was noted in one case. The lungs contained a few disseminated tubercles

In only one case was tuberculous disease of the brain noted. In this case the lungs contained granulations and miliary tubercles without exudation or cavity; tubercles existed in the liver, spleen, and kidneys; ulceration existed in the small intestine, and the mesenteric glands were enlarged. The appearances within the skull have been already stated. (*Vide* page 24.)

CHAPTER II.

ETIOLOGY.

Influence of age—Evidence therefrom of a constitutional predisposition—Influence of sex—Influence of occupation—Influence of antecedent diseases; pleurisy, pneumonia, and bronchitis—Hæmoptysis—Antecedent diseases; intermittent fever, measles, dyspepsia, diarrhœa, rheumatism, perineal fistula, scrofulous affection of the glands of the neck, syphilis, bronchocele, psoriasis, parotiditis, smallpox, typhoid and yellow fever, dysentery, diabetes and Addison's disease—Influence of pregnancy and lactation—Influence of congenital predisposition and hereditary tendency.

WITH reference to etiology, the study of my cases will embrace the results of an analysis as regards age, sex, occupation, antecedent affections, pregnancy, lactation, and, finally, a congenital predisposition which may be inherited.

1. Influence of Age.

My collection of cases embraces but a single case under 10 years of age. It is not to be inferred therefrom that I have observed only one case of phthisis occurring under this age, but simply that other instances which have come under my observation are not included in this collection. As is well known, cases in which the pulmonary affection constitutes the exclusive or chief manifestation of tuberculous disease are comparatively rare during the first decade of life. The omission to include cases which my records may contain, was an inadvertency; but to supply the defect, after having devoted several months to making abstracts of the cases in this collection, would involve an amount of labor which the result would hardly repay. The analysis respecting age, therefore, is to be considered as taking in the successive decades of life subsequent to the age of 10 years. The number of cases (after 10 years) in which the age was noted is 583. The four decades, after the first ten years, are represented as follows:—

From ten to twenty years,	Males 22,	females 17;	total 39 cases.
From twenty to thirty years,	" 232,	" 75;	" 307 "
From thirty to forty years,	" 106,	" 26;	" 132 "
From forty to fifty years,	" 58,	" 9;	" 67 "

The age exceeded 50 years in 38 cases; 29 of these cases being males and 7 females.

The foregoing figures show that in my cases the decades from 10 to 50, enumerated in the order of the relative number of cases, are as follows: 20 to 30; 30 to 40; 40 to 50; 10 to 20. The number of cases over 50 lacks only a single case to be equal to the number between 10 and 20 years. The age of the oldest patient was 78 years. In several cases the age was above 60 years. Taking into account the fact that the number of persons living who are above 50 years of age is much less than the number of those between 10 and 20 years of age, the liability to the disease must be considerably greater after 50 years than during the second decade of life. The striking fact in this analysis is the large proportion of cases in which the ages were between 20 and 30 years, the number exceeding one-half of all the cases. This fact, however, is by no means novel. Statistics have already established abundantly the etiological law that the liability to pulmonary tuberculosis is greater between these ages than at other periods of life. My figures are simply in accordance with this well-known law. Now a question which has an important pathological bearing relates to this law, namely, why is it that the disease is more likely to be developed between these ages? Assuredly it is not because during this period of life persons are more exposed to extrinsic morbific causes acting upon the pulmonary organs; nor because other pulmonary affections, such as bronchitis, pneumonia, etc., are of more frequent occurrence. The explanation seems to involve, of necessity, an intrinsic predisposition or tendency which, in the existing state of our knowledge, we cannot explain. This conclusion has an obvious bearing on the pathological doctrine of the existence of a diathesis, meaning to express by this term simply an intrinsic tendency or predisposition to phthisis. The marked tendency to the development of the disease during a particular decade of life, irrespective of any appreciable determining cause, must be considered as evidence of that inappreciable causative condition which is understood by the term diathesis, a condition the existence of which is not rendered less certain by an acknowledgment of our inability to explain it.

The number of males and females respectively is given in the

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above enumeration; but, as will be seen under the next heading, my collection of cases embraces a much larger number of the former. The relatively small number of females affected after the age of fifty years, is a noteworthy fact.

2. The Influence of Sex.[1]

The sex is noted in 669 cases. The number of male cases, in private practice, was 321; of female cases, 127. In hospital practice, the number of male cases was 187; of female cases, 37. In private practice, there were no apparent reasons why a larger number of men than of women, affected with this disease, should have come under my observation. In hospital practice, it may have often happened that my service embraced more male than female patients: the latter fact may, perhaps, explain the discrepancy between private and hospital practice in respect of the disproportion between the male and female patients affected with pulmonary tuberculosis. In hospital practice the male exceed the female cases by more than two-thirds; in private practice the preponderance of males is somewhat less. The greater liability of men than of women to this disease is, however, exemplified in both collections of cases. In the two collections united, the number of male cases was 505, of female cases, 164, the excess of the male over the female cases being very nearly two-thirds.

The result of the analysis as regards sex is at variance with Louis's statistics. Of 123 cases observed by Louis during a period of more than three years, in a service at La Charité, Paris, embracing 48 beds, equally divided between men and women, 66 were women and 57 were men. From the greater number of women, Louis inferred some causative influence belonging to the female sex. This variation, perhaps, illustrates the liability of such statistics to be affected, at different times and places, by extrinsic circumstances which are not always readily determinable. Whether in Paris, in the years 1821,

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[1] The portions of this chapter which relate to the influence of sex, occupation, and antecedent affections, formed a paper which was read at a meeting of the New York Academy of Medicine, November 21, 1872. This will account for my entering somewhat into a discussion of certain pathological questions involved in these topics.

'22, and '23 there were reasons why more women than men with phthisis should seek refuge in La Charité Hospital; or whether the causes of phthisis, at that time in that city, affected more women than men, and if so, whether this is true of the years which have since elapsed; or, again, whether there are circumstances on the one hand peculiar to France, and on the other hand peculiar to this country, affecting the proportion of men to women who become phthisical—these, and other points of inquiry, I shall not undertake to discuss.

3. The Influence of Occupation.

Of the male cases in private practice, the occupations were noted in 212. In this number of cases, 70 different occupations are represented. 32 patients were clerks. They constitute a much larger representation than is furnished by any of the other occupations. 4 were book-keepers, an occupation which, as regards hygienic influences, is very similar to that of a clerk. 30 were physicians; but, doubtless, circumstances of a personal character determined the number of representatives of the medical profession, so that this number is not to be considered as any evidence of the influence of this calling in the etiology of the disease. The same is to be said of medical students, the number of the latter being 8. The number of merchants is the largest, after clerks and physicians, namely, 15. The next most numerous are lawyers, the number being 14. Farmers come next; of these there were 11. There were 2 law students, and 3 students whose line of study was not specified. 6 patients were clergymen; 7 were Southern planters; 4 were commercial travellers; 3 were machinists; 5 were teachers; 2 were manufacturers; 2 were melodeon-tuners; 2 were railroad contractors; 2 were hotel-keepers; 2 were editors; 2 were publishers; 4 were soldiers; and 2 were sailors. Of the remaining 46 occupations, each one was represented by a single case. The following is a list of these 46 occupations: Tailor, maker of burr mill-stones, doorkeeper, cabinet-maker, joiner, portrait painter, banker, lake captain, engineer, fuller, railroad superintendent, contractor, singing-master, deputy sheriff, varnisher, ship-carpenter, grocer, transportation agent, saddler, agent, real-estate agent, carriage-maker, druggist, livery-stable keeper, hostler, president of college, peddler, gambler, drayman, architect, carpenter, footman, baker, secretary of insurance company, lithographer, broker, provision dealer, diplomatist, brushmaker, homœopathic practitioner, professor of chemistry, telegraphist, liquor dealer, policeman, harness-maker, and inspector of masonry.

Of the cases in hospital practice, the occupations were noted in 158, and 48 different occupations are represented among these cases. The occupation of a laborer predominates vastly over all others, the number being 69. This is readily explained by the fact that, of those who seek refuge in hospitals, by far the largest proportion belong to the class called laborers. Seamen come next in number; 9 were of this class. Clerks and tailors come next; of these the number was the same, namely, 7. 4 were waiters; 3 were farmers; 3 were boatmen; 3 were butchers; 3 were hostlers; 2 were printers; 2 were blacksmiths; 2 were merchants; 2 were tinsmiths; 2 were servants; 2 were stone-cutters; and 2 were soldiers. Of the remaining 31 occupations, each was represented by a single case.

Reviewing the foregoing numerical facts, the attention is at once arrested by the large number of clerks in the cases in private practice. There is no apparent reason for the great preponderance of patients pursuing this occupation, except that it involves an influence in the etiology of pulmonary tuberculosis. Nearly one-sixth of the 218 cases were either clerks or book-keepers. Now, in a hygienic point of view, the distinctive feature of the occupation of a clerk or a book-keeper, is its sedentary character, together with confinement within doors, often in small, heated, and illy-ventilated rooms. The hygienic conditions, as regards diet, mental excitements, habits of temperance, etc., are, as a rule, certainly not less favorable to health than in most other occupations. As it seems to me, it may fairly be concluded that these facts go to show an agency in the circumstances belonging to the life of clerks and book-keepers, which conduces to the development of pulmonary tuberculosis. The number of merchants may be considered as having, measurably, the same significance, about $\frac{1}{14}$th of the whole number of cases representing this occupation, which in general involves more or less confinement within doors and sedentary habits. Other occupations involving, to a greater or less extent, the same hygienic circumstances, are those of the lawyer, the teacher, the printer, the student, the editor, the publisher, the melodeon-tuner, and the clergyman. The number of cases in these occupations collectively, was 40, the proportion being nearly one-fifth of the whole number of cases. Adding together all the cases representing the occupations just named, the number is 91, the proportion being considerably nearer one-half than one-third of the whole number of cases. If, for reasons which have been given, the physicians and medical students be thrown out, leaving the number of cases 174, the cases representing occupations which involve especially confinement within doors and sedentary habits, are more than half the whole number of cases.

It will be observed that in this analysis I exclude the female cases. The occupations in some of the latter are noted as seamstresses, domestics, etc.; but in the majority of these cases the patients could not be said to have any definite occupation.

Exclusive of the cases which have been enumerated as representing sedentary occupations and confinement within doors, and excluding physicians and medical students, the number of cases in private practice remaining is 83. It is noteworthy that, of these 83 cases, 46 represent each a different occupation. The other 37 cases represent 9 occupations, as follows: Farmers, 11; Southern planters, 7; commercial travellers, 4; machinists, 3; manufacturers, 2; railroad contractors, 2; hotel-keepers, 2; soldiers, 4; and seamen, 2.

Another noteworthy fact is this: Of the different occupations (55) represented by these 83 cases, two only involve the habitual inhalation of particles which occasion local mechanical irritation of the bronchial mucous membrane. One of these is stone-cutting, represented by two cases; the other is the manufacture of burr mill-stones. But the patient who represented the latter occupation had not for many years been exposed to the inhalation of dust. This case is one of much interest, and I subjoin a brief synopsis of it.

The patient, when he came under my observation, was about forty years of age. He had recently had repeated attacks of hæmoptysis, and the existence of phthisis was rendered clear by symptoms and physical signs. His death took place about two months afterward. The antecedent history was as follows: Eighteen years previously, he was engaged in the manufacture of the burr mill-stones, himself working in this occupation. He then had cough and other symptoms which appeared to denote pulmonary consumption. He ceased working in the sheds where the mill-stones were manufactured, and attended exclusively to out-of-door duties connected with the business. Gradually he recovered his health, and he remained perfectly well, excepting occasionally cough and expectoration, having become robust and stout, until he had a perineal abscess eventuating in fistula, for which a surgical operation was performed with partial success. A year afterward, while apparently well, he had a slight attack of hæmoptysis. The hæmoptysis recurred, and was more abundant; cough, with expectoration, followed, and the signs showed solidification of lung when he came under my observation, a week after the first hemorrhage.

The autopsy showed recent pleuritic adhesions on both sides, with numerous small tubercles, patches of exudation, and softened collections in the right lung, the left lung being crammed with miliary tubercles without any exudation. These appearances were, doubtless, connected with the recent rapid disease. In addition, near the apex of each lung was a solid mass of about the size of a hen's egg, somewhat larger on the right than on the left side. These masses, on section, appeared to consist of condensed tissue of a reddish color, rather friable, and contained disseminated calcareous particles. Each mass was inclosed in a thick, firm cyst. The masses extended to the anterior superficies of the lungs, and at their site the surface had a contracted, puckered appearance.

It can hardly be doubted that these masses were connected with the symptoms denoting phthisis eighteen years before the death of the patient. There may be room for the question whether the affection, at that time, was not a chronic interstitial pneumonia.

Of the cases in hospital practice, the large number of "laborers" has been already accounted for. The number of seamen is explained by the fact that my hospital service sometimes embraced wards appropriated to this class. In seeking for facts bearing on an etiological influence, therefore, these cases should be excluded. Excluding them, the remaining number of cases is 80. Discriminating between these 80 cases with reference to the occupations which are especially sedentary, and which involve confinement within doors, they are as follows: Clerks, 7 cases; book-keeper, 1 case; teacher, 1 case; tailors, 7 cases; printers, 2 cases; merchants, 2 cases; shoemaker, 1 case; weaver, 1 case; tinsmiths, 2 cases; confectioner, 1 case; barkeeper, 1 case; lawyer, 1 case; total, 27 cases. The proportion is a little over one-third of the whole number.

An important element in this numerical analysis, as compared with that of the cases in private practice, relates to the circumstances connected with different occupations leading patients to seek refuge in hospitals. I cannot, however, enter into a consideration of this element. It is to be noted that clerks and book-keepers here, as in the cases in private practice, are the most numerous, the number being 8 out of 80 cases. The next largest in number are tailors, 7 out of 80 cases. With the exception of weavers (2 cases), the other occupations are represented each by a single case. The cases which do not represent sedentary occupations with confinement within doors (53) are distributed among 34 different occupations. Of these 34 occupations, 24 have each but a single representative. The remaining 19 occupations are represented as follows: Soldiers, 2 cases; joiners, 3 cases; stonecutters, 2 cases; hostlers, 3 cases; blacksmiths, 2 cases; waiters, 4 cases; servants, 2 cases; boatmen, 3 cases; carpenters, 5 cases; and butchers, 3 cases.

Making due allowance for the circumstances which determine men of different occupations to resort to hospitals, the result of this numerical analysis of my cases in hospital practice corresponds to that of the analysis in private practice. The general conclusion is, that occupation has an agency in the etiology, in so far as it is sedentary and involves confinement within doors. If it be said that this conclusion is in accordance with what is already known, I answer, that the correctness of the conclusion is thereby the more certain. My object is to study, by means of numerical analysis, my cases, without reference to similar researches by others; and if the results of my analytical investigation are in conformity with those which have been already obtained, this is certainly no disparagement of their correctness, nor does it impair their value as a contribution to our knowledge.

4. The Influence of Antecedent Diseases.

My records, in a considerable number of cases, embrace information respecting the health of the patients prior to the development of the disease; and I shall proceed to analyze the cases with reference to antecedent diseases which may be suspected of having had an etiological influence. Here, however, my notes contain only certain "positive facts;" that is, I have not been careful to record the absence of diseases which do not appear in the account of the "previous history." The presumption is, that when the records embrace an account of the previous health, diseases of which no mention is made had not occurred. In other words, it is probable that these diseases occurred only in the cases in which it is so stated; but I cannot assert this with positiveness. Moreover, in not a few of the records, the account of the previous health is either evidently incomplete, or wanting. With regard to antecedent diseases, therefore, I shall not assume for the numerical results exactness as regards the proportion of cases in which they respectively occur. The analysis, however, of my cases will doubtless lead to deductions far more reliable than impressions derived from a merely recollected experience, and still more reliable than the opinions which rest solely on either conjecture or a theoretical basis.

Naturally I am led to interrogate the cases first with reference to certain antecedent pulmonary affections, namely, pleurisy, pneumonia, bronchitis; and in this connection may be considered hæmoptysis.

Pleurisy is noted as having occurred prior to the development of the tuberculous affection in 22 cases. In determining the date of the phthisis, the commencement of a persistent cough is taken as the criterion with respect to pleurisy, and also other antecedent diseases. Now, in determining the etiological influence of the pleurisy, the interval between the pleuritic disease and the commencement of the cough which denoted the phthisis is, of course, an important consideration. It is to be added, that, in deciding that pleurisy had existed at some former period, it was necessary in most cases to judge from the statement of patients, together with such an account of the symptoms as could be obtained, and the appearance of the chest. In some of the cases evidence was obtained from a post-mortem examination; and in a few cases the pleurisy had occurred when the patients were under my observation.

The facts pertaining to the relation of pleurisy to the development of the phthisis in the 22 cases, are as follows: The phthisis appeared to follow the pleurisy, either immediately or quickly, in 11 of the 22 cases, precisely one-half. In the remaining 11 cases, the pleurisy had preceded the persistent cough for periods varying from 4 years to several months. The interval was 4 years in 1 case only. It was 3 years in 3 cases. It was noted as "several years" in 1 case. It was 2 years in 2 cases. It was one year in 2 cases. It was noted as "several months" in 1 case; and in one case it is simply stated that two attacks of pleurisy had preceded the cough.

In one of the cases in which the persistent cough followed immediately, the pleurisy was attributed to an injury of the chest by a blow from the handle of a plough.

It is noted in 6 cases that the pleurisy was acute, and in 7 cases the disease was chronic—the notes being defective with reference to this point in the remaining cases.

We are certainly warranted by these facts in concluding that phthisis is rarely preceded by pleurisy. Twenty-two instances make a small proportion out of several hundred cases. It is also a warrantable conclusion, that in some of these twenty-two cases there was no pathological connection between the pleurisy and the phthisis. Out of several hundred persons affected with any disease, or persons in good health, a certain proportion would be found to have had pleurisy within a period of four years. Some allowance is therefore to be made for mere coincidence. It is perhaps fair to conclude, that, of the eleven cases in which the persistent cough did not follow either immediately or quickly, the pleurisy, at least in several instances, had no etiological influence. On the other hand, excluding these eleven cases, in the remaining eleven cases in which a persistent cough did follow either immediately or quickly, a pathological connection is to be inferred. In a very small proportion of cases, therefore, pleurisy seems to stand in a causative relation to phthisis, and yet there is room for the supposition that, in these cases, the causative relation is the reverse of this. The tubercles first formed may be seated at the superficies of the lung, and the pleurisy may be in consequence of their production. The pleuritic effusion having the effect of arresting for the time the progress of the phthisical affection, the symptoms denoting the latter may not appear until after more or less absorption of effused liquid has taken place. This is, perhaps, the most rational view of the etiological relation between phthisis and pleurisy, when the latter appears to have immediately preceded the former.

Pneumonia—meaning thereby the ordinary lobar form of pneumonic inflammation—is noted to have occurred, as an antecedent disease, in only nine cases. The very small number of cases is in striking contrast with an opinion which seems to be current with physicians, namely, that phthisis is apt to originate in an attack of pneumonia. This opinion is certainly not sustained by clinical experience. Even in the nine cases in which pneumonia preceded, the interval between an apparent recovery from the pneumonia and the development of phthisis, renders it probable, if not certain, that there was no pathological connection between the two diseases. In one case this interval was four years. In one case it was two years. In one case it was six months. In the remaining six cases phthisis appeared to follow either immediately or quickly the attack of pneumonia. Assuming that in these six cases, or even in all the nine cases, there was a causative relation, the result of this analysis certainly warrants the conclusion that the danger of acute lobar pneumonia being followed by phthisis is extremely small.

This conclusion is corroborated by clinical experience from another standpoint, namely, an analysis of recorded cases of pneumonia with reference to the occurrence of phthisis as a sequel. In 1861, I prepared a "Clinical Report on Pneumonia, based on an analysis of one hundred and three cases."[1] These cases I had recorded during the preceding twelve years. In not one of these cases was it noted that phthisis followed the pneumonia. It is true, that, in a considerable number of the cases which recovered, the patients passed from observation shortly after recovery; but had the pneumonia ended in phthisis, the fact would surely have been embraced in the record, and so, also, if the latter disease had been developed shortly after the termination of the pneumonia.

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[1] *Vide* American Journal of Medical Sciences, Jan. 1861.

That pneumonia has little or no influence in the etiology, is further shown by a fact established by the numerical researches of Louis; namely, that when persons already tuberculous are attacked with pneumonia, the termination is generally in recovery. This fact was corroborated by my analysis. In seven of my cases, the patients affected with pneumonia were phthisical; and in all these cases, save one case, recovery took place. In the excepted case the lungs were found, after death, crowded with miliary tubercles. It was a case of acute tuberculosis.

As with pneumonia, so with pleurisy; an analysis of cases of the latter disease sustains the conclusion to which I have been led respecting its influence in the etiology. An analytical study of recorded cases shows phthisis to be a rare sequel. In 1852, I prepared a "Clinical Report on Chronic Pleurisy, based on an analysis of forty-seven cases."[1] Of these forty-seven cases, in three the subsequent development of phthisis was probable, although not demonstrated; and in one case only the occurrence of this disease as a sequel was certain. Of fifty-three cases analyzed with reference to this point by Dr. Blakiston, not one became phthisical during the lapse of several years after recovery from the pleurisy.[2] The effect of chronic pleurisy with effusion, in a person already phthisical, is, as is well known, to arrest for a time, or retard, the progress of phthisis.

I should add, in eight cases the histories showed that, immediately or shortly before the phthisis, there had occurred some acute affection within the chest, the character of which was not determinable by the information obtained from the patients.

I come next to inquire respecting the occurrence of *bronchitis* as an antecedent disease. And, to avoid misapprehension, let me state that my inquiries will relate to bronchitis having the characters of a primary affection, namely, an inflammation of the bronchial mucous membrane, either acute or subacute, affecting the bronchial tubes about equally on both sides, that is, bilateral, extending more or less along the tubes, generally preceded by coryza, and not infrequently by subacute laryngitis. As thus described, the affection embraces cases of so-called pulmonary or bronchial catarrh—a term which I cannot but regard as superfluous and objectionable. In popular parlance, the affection is known as a "cold in the chest." Now, do my cases show that this affection enters into the etiology of phthisis?

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[1] *Vide* Buffalo Medical Journal and Monthly Review, Nov. 1852.

[2] *Vide* Practical Observations on Certain Diseases of the Chest. Republished by Lea & Blanchard in 1843.

Of 112 cases, the histories contain information bearing on the foregoing question. This information relates to the cough, as regards severity, and the absence of expectoration at first, and during a greater or less period. In only one case is it noted that, according to the patient's statement, there was expectoration with the commencement of cough. In one case there was no cough when the patient first came under my observation, the only ailment complained of being debility, while physical exploration gave unequivocal evidence of phthisis which ended fatally. In only two cases is it noted that the patients were subject to frequent attacks of bronchitis, or, using their language, especially liable to "take cold," prior to the development of the phthisis. In 72 of the cases, the cough was stated to have been at first, or for some time, without expectoration, that is, dry. In the great majority of the histories it is simply noted that, either at first or for some time, the cough was dry. In 39 of the 112 cases, nothing is noted with reference to this point. The duration of the dry cough was noted in 17 cases, as follows: Several months, 6 cases; eight months, 1 case; six months, 2 cases; four months, 2 cases; two months, 1 case; one month, 1 case; several weeks, 1 case; three weeks, 1 case; "a long time," 1 case; and a "considerable period," 1 case. In 74 of the cases the cough is noted to have been at first, or for some time, slight. The fact simply of the cough having been at first, or for some time, slight, is noted in 57 cases. In 17 cases, the length of time during which the cough was slight is noted as follows: "Several months," 5 cases; "several years," 1 case; "many months," 1 case; eight months, 1 case; six months, 1 case; four months, 1 case; three months, 1 case; one year, 2 cases; six weeks, 2 cases; one month, 1 case; and three weeks, 1 case. In 4 cases the cough was at first violent, in one of the cases being compared to whooping-cough; but in all these cases it was at first, and for some time, dry. In 34 of the 112 cases, nothing is noted respecting the cough being at first either slight or severe.

In a considerable number of my cases—or, to be precise, in

39—I have noted that the patients attributed the disease to "taking cold." In several of these cases the commencement of cough was dated from some particular exposure, such as being out of doors in inclement weather, or getting wet. It is needless to say that statements in this regard have little or no value, since it is well known to be a popular notion that all affections of the chest, as well as a host of other affections, originate in a "cold." I presume no one will take exception to my considering the opinion of patients with reference to this point as of no weight in determining the existence of an antecedent bronchitis.

What is the conclusion to be drawn from the facts contained in my histories? Evidently, the conclusion is, they contain no evidence whatever that bronchitis has a causative influence in the development of phthisis. With a single exception, in no instance do the characters of the cough, at its commencement, show that bronchitis existed as an antecedent affection. On the other hand, the histories, as regards the early pulmonary symptoms, go to show that they were incidental to the phthisis. The evidence of this is in the slightness and the dryness of the cough at first and for some time, or, in not a few cases, for a considerable or a long period afterward. These facts are inconsistent with a primary bronchitis. If, as in the consideration of pleurisy and pneumonia, we take as a stand-point cases of bronchitis, either acute, subacute, or chronic, and inquire how often does phthisis occur as a sequel, we must answer the question, not by figures, but by impressions founded on unrecorded experience. I cannot refer to a collection of recorded cases of bronchitis. But it is well known how common are cases of this affection. Now, I put this question to medical practitioners: Whenever you have no reason to doubt that a patient has only a bronchitis, either acute, subacute, or chronic, do you entertain apprehensions that this patient will become phthisical as a consequence of the bronchitis? In the absence of statistical data embraced in the recorded histories of cases of bronchitis with reference to phthisis as a sequel, there is no alternative to this appeal to experience not based on the analysis of recorded cases. I think there is hardly room for doubt as to the answer to this question. Let a physician be satisfied that his patient has nothing more than a bronchitis, or a "common cold," and he feels no anxiety as to danger of consumption. Let it be decided that cough and expectoration, however protracted, be the symptoms of only a chronic bronchitis, and there may be danger of asthma and emphysema, but phthisis is not to be apprehended. I have, as I believe, in this way expressed the sentiments of the great majority of the experienced practitioners with whom it has been my fortune to be brought into professional relations.

The conclusion which I have drawn from the analysis of my cases, respecting the etiological influence of bronchitis, is not in conformity with some late teachings by a German school, of which Niemeyer was the exponent. Niemeyer inculcated the doctrine that bronchitis not infrequently leads to pulmonary consumption. He says: "A simple genuine catarrh may extend into the air-vesicles in a person of apparently perfect health and vigor," and "healthy men should never feel sure that they will not die of an acute or chronic catarrhal pneumonia (*i. e.* of phthisis) proceeding from a cold." Again, "Numerous examples exist in the practice of every experienced physician, in which the cough has commenced on some particular day following a severe cold, soon after which the other symptoms of consumption have made their appearance."[1] He inculcated this doctrine as having an important influence on the treatment of consumption. Indeed, he proposed as a name for the so-called tuberculous exudation—that is, the ordinary form of phthisis—"chronic catarrhal pneumonia," with express reference, as he stated, to the influence on measures of prophylaxis and therapeusis.

I shall not here discuss this doctrine on the ground of its inconsistency with well-known pathological facts, such as the frequency of bronchitis in childhood and in old age, periods of life when the development of phthisis is relatively rare; the fact that for bronchitis to extend into the bronchioles it must be of the variety known as capillary, and this variety is exceedingly rare during the period of life when phthisis is most apt to occur; the improbability of bronchitis, which is a bilateral affection, giving rise to the "catarrhal pneumonia," *i. e.*, exudation, on one side only, for a considerable period before the affection occurs on the other side; and, finally, regarding the affection as a variety of chronic pneumonia, the fact that a bronchitis, however acute, and even when it affects the smaller tubes, has no tendency to give rise to an acute pneumonia. Waiving a discussion into which these and other facts would enter, I will simply raise the inquiry, How is the doctrine that pulmonary consumption, as stated by Niemeyer in another quotation, "arises, with rare exceptions, through extension of a chronic catarrh into the finer terminal bronchioles, and thence into the pulmonary vesicles," to be either proved or disproved? The answer to this question is plain. The doctrine is to be either proved or disproved by direct clinical observation; that is, determining, by an analysis of a sufficient number of recorded cases, whether pulmonary tuberculosis often, or rarely, commences with, or is preceded by, bronchitis. Niemeyer did not claim to have himself studied cases in this way, nor did he base the doctrine on the studies of others. His assertions, therefore, dogmatic as they are, have only the value of an opinion resting on conjecture or on theoretical reasoning.

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[1] Text-book of Practical Medicine, seventh edition. Translation by Drs. Humphreys and Hackley.

I should have more reserve, perhaps, in referring thus to Niemeyer, if my own clinical studies in relation to the causative influence of bronchitis stood alone. It is now nearly fifty years since the publication of Louis' Researches on Phthisis.[1] He studied eighty carefully recorded cases with reference to antecedent affections. His conclusion was, that "pulmonary catarrh," *i. e.*, bronchitis, as also pneumonia and pleurisy, rarely, if ever, enter into the etiology of phthisis. The great man just named has but recently been called to the sphere which lies beyond our present life. His work on phthisis was, I believe, the first which exemplified the numerical method of investigation, of which he was the founder. Then followed his great work on the typhoid affection. No stronger evidence of the value of the method of study which he inculcated and practised can be adduced than this: nearly all his conclusions have been confirmed by the researches of others who have repeated his labors; and, remaining to-day more firmly established than at first, they will so continue forever, unless, with the lapse of time, diseases undergo material changes.

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[1] Recherches Anatomico Pathologiques sur la Phthisie. Par Ch. A. Louis. Paris, 1826.

As an antecedent event, hæmoptysis is now to be studied.

This event occurred prior to the commencement of a persistent cough in 61 cases. In 26 cases persistent cough, with other evidence of the existence of phthisis, followed immediately a hæmoptysis. In 37 cases hæmoptysis occurred once or repeatedly, cough and other evidence of phthisis following after an interval of greater or less length.[1] The length of the interval varied much in the different cases.

It is noted in one case to have been sixteen years; in one case fifteen, and again four years; in one case ten years; in one case six years; in one case four years, and, in this case, there were several recurrences of the hemorrhage; in two cases three years, in one of which repeated attacks occurred; in one case two years, and there were three successive attacks; in two cases two years; in two cases one year; in five cases several months; in one case six months; in two cases four months; in one case two months; in one case eight months; in one case five attacks during three months, persistent cough following the last attack; in two cases two attacks with an interval of a month between the two, and persistent cough following the last attack. In the remainder of the cases the interval is not specified. In sixteen cases it is noted that the hæmoptysis occurred when the person affected appeared to be in perfect health. In a few cases the hæmoptysis followed some unusual muscular exertion; but, in most of the cases, no apparent exciting cause of the hemorrhage is noted.

It is noteworthy that the development of phthisis was preceded by hæmoptysis in such a considerable number of cases. The number of cases in which phthisis became developed many months and years after the occurrence of hæmoptysis, is also worthy of note. In this latter point of view, the facts go to show that hæmoptysis is to be considered a forerunner of phthisis, albeit the latter may be long delayed. Ware's valuable analysis of 386 cases of hæmoptysis, noted in private practice during a period of about forty years, showed that in sixty-two cases the patients were afterward known either to be living in ordinary health, or to have died of other diseases having no connection with phthisis, the length of time during which this immunity continued varying from two to thirty-seven years.[1] Doubtless in more or less of these cases, phthisis existed when the hæmoptysis occurred, the patients recovering from the phthisical affection. Of the cases in which phthisis did not appear to coexist, judging from the facts developed by my analysis, it is probable that some became affected with phthisis after the date of the analysis of the cases, and also that phthisis would have probably occurred in some of the cases had not the persons been taken off by other diseases. Moreover, the hæmoptysis may in some of the cases have denoted a tendency to phthisis which, from age or the operation of prophylactic influences, did not become developed.

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[1] In two of these cases previous attacks of hæmoptysis had occurred.

One conclusion, then, to be drawn from the results of my analysis is, that, whenever hæmoptysis is not evidence of existing phthisis, it has significance as a prodromic event. Another conclusion is, that hæmoptysis is not a cause of phthisis, as was asserted by Niemeyer. This is a fair inference from the fact, that in only about one-third of the cases in which hæmoptysis occurred as an antecedent event, was it immediately followed by the evidence of pulmonary disease, an interval of weeks, months, or years elapsing in two-thirds of the cases.

Regarded in the light of a prodromic event, hæmoptysis has of course some pathological connection with the development of phthisis. It is not an inconsistent, if, indeed, it be not a rational supposition, that, in certain cases, the occurrence of bronchial hemorrhage, so far from being a cause of, may be a substitute for, the local processes involved in the production of phthisis. This supposition is in harmony with a conclusion drawn from Ware's statistics, namely, that hæmoptysis, occurring *after* the development of phthisis, is of favorable import, as regards either the arrest or the retardation of the progress of the phthisical disease.

With regard to antecedent diseases other than those affecting the pulmonary organs, an analysis of my cases furnishes the following facts:—

Intermittent fever is noted in twenty-five cases, exclusive of those in which it is not certain whether the paroxysms were malarial or incidental to the pulmonary affection. In seven cases the phthisis is noted to have become developed immediately after an attack of intermittent fever. In four cases the symptoms of the pulmonary affection occurred during the continuance of intermittent fever. In five cases it is noted that the pulmonary affection followed soon after intermittent fever; and in four cases it is simply noted that intermittent fever preceded the phthisis. In these twenty cases, the two diseases were in close chronological connection. Of the remaining five cases, it is noted in one case that intermittent fever preceded with an interval of several months; and in one case, simply that the patient was subject to intermittent fever. In three cases, intermittent fever had occurred frequently during, in one case, the preceding year, in one case the preceding five months, and in one case the preceding three months. These facts do not go to support an opinion heretofore held by some, that malarial toxæmia affords a security against phthisis.

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[1] On Hæmoptysis as a Symptom, by John Ware, M.D., etc. Publications of the Massachusetts Medical Society, 1860.

Measles is noted as an antecedent disease in six cases. In two of these cases, persistent cough dated from the attack of measles; in one case six months, in one case one month, and in one case five years elapsed between the measles and the development of phthisis.

Dyspepsia is noted in five cases. In one case it had existed for fifteen years; in one case for several years; in one case for a year; in one case for several months; and in one case its duration is not noted.

Diarrhœa is noted in three cases. It had existed in one case for four months; in one case for a month; and in one case the duration is not noted.

In three cases the patients were subject to attacks of rheumatism; and in one case the phthisis immediately followed rheumatism which had existed for three months.

Perineal fistula preceded the pulmonary disease in four cases. In one of these cases the fistula had been nearly cured nine months before the first symptoms of an affection of the lungs. In one case it preceded a second occurrence of phthisis, the patient having, apparently, recovered from the disease four years previously. In one case an operation had been performed for the cure, but without any success. In the remaining case the fistula occurred a year before the development of an affection of the lungs, and was cured by a surgical operation.

A scrofulous affection of the glands of the neck was noted in three cases. In one of these cases the cervical glands had been swollen two years before the development of the pulmonary affection. In another case, suppuration of these glands had taken place a year previously, and there were present the characteristic cicatrices, the age of the patient being 24. In the remaining case there had been suppuration of these glands, leaving characteristic cicatrices, when the patient was 14 years of age, the age when the case came under observation with phthisis being 34 years.

In five cases it is noted that the patients had had syphilis; but it is quite certain that in many, if not most of the cases, inquiries were not directed to this point.

In one case bronchocele had existed, and a cure was effected by iodine, a year before the occurrence of phthisis.

One patient had been affected for a long time with psoriasis.

One patient had had parotiditis shortly before the development of the pulmonary disease.

In one case the pulmonary disease followed shortly after recovery from smallpox; in two cases shortly after typhoid fever; and in one case, shortly after yellow fever.

In four cases it is noted that the health was impaired prior to the pulmonary affection, but without any well-defined disease.

In one case dysentery preceded, for a short period, the pulmonary affection.

One patient had had urinary calculi.

In one case there had been three operations for the removal of recurring fibroid tumor of the neck.

In one case the tuberculous affection was preceded by suppurative inflammation of the ankle, and also disease of the hip.

In one case the affection was developed in a patient with diabetes mellitus, and in one case in a patient with Addison's disease.

5. The Influence of Pregnancy and Lactation.

In twenty-two cases phthisis was developed either during pregnancy or not long after confinement. In the cases in which the patients were not under my observation at the time of the development of the disease, the date of the commencement of the latter was determined by the occurrence of cough and other symptoms, local and general, which rendered it quite certain that the pulmonary affection then occurred. When the large number of cases in my collection is considered, twenty-two cases seem but a small proportion; but in the analysis with reference to pregnancy and lactation, many cases are to be excluded. Of course, the analysis is to be restricted to the female cases, and, of the latter, they who were married and widows are not to be included. It is also proper to exclude females who were beyond the period of life when pregnancy is likely to take place, that is, those over forty years of age. In a considerable number of cases the histories are defective as regards marriage or age. Throwing out these cases, the number remaining is 133, of which 33 were unmarried, 6 were widows, and 7 were over 40 years of age. Deducting these cases, the number remaining is 87. Thus, out of 87 cases in which the patients were married and under 40 years of age, disease was developed either during or not long after pregnancy in 22. This is not a small proportion of cases, being about one-fourth. The proportion is significant as denoting an etiological connection between pregnancy and the development of phthisis. Of these 22 cases, the pulmonary disease was developed during pregnancy in 10. In 12 cases the development was not long after confinement, that is, within a few weeks or months. In 6 of the latter cases, it is noted that the development was during lactation, the histories being defective as regards information on this point in the remainder of the cases. So far as these data go, they show that in $11\frac{1}{2}$ per cent. of married females under 40 who are phthisical, the disease is developed during gestation, and in $13\frac{69}{87}$ per cent. soon after confinement. The inference is that pregnancy, either directly or indirectly, has not only a decided but a considerable influence in the etiology of phthisis. The question here arises, How much agency belongs to lactation when the disease is developed shortly after confinement? This question has an important practical bearing, namely, on the propriety of weaning in cases in which there is ground for supposing a predisposition to phthisis. My data do not warrant any conclusion with respect to this point. The results of the analysis are, however, conclusive as regards another practical point, namely, the propriety of advising marriage as a measure of prophylaxis with reference to phthisis. The influence of pregnancy upon the progress of tuberculous disease developed antecedently to the occurrence of pregnancy, is not to be confounded with the etiological influence; facts with regard to the former belong among the points of inquiry falling under the head of the clinical history and of prognosis.

6. The Influence of Congenital Predisposition and Hereditary Tendency.

The analytical study of the history of a large number of cases of phthisis with reference to age, antecedent diseases, and the occupations of patients, suffices to show that the etiology of the disease involves a constitutional predisposition or tendency expressed by the name diathesis. Questions relating to the essential nature of the diathesis, are altogether independent of the fact of its existence. Whether the diathetic condition be a peculiar susceptibility which some late writers denominate vulnerability, or whether it gives rise to an active causative agency, are points of inquiry which I shall not here enter into. In the absence of positive facts bearing on these and other analogous questions, any opinions which may be formed must rest chiefly on conjecture. But assuming the existence of a diathesis, important questions relate to its existence congenitally, and to its transmission by inheritance. I shall proceed to study my cases with reference to these questions. It is superfluous to say that the fact of the existence of a diathesis is involved in an innate predisposition to the disease. How is the existence of the latter to be determined? By facts showing the prevalence of the disease among members of the same family to an extent, and in a number of instances which cannot be accounted for by supposing a series of coincidences, or, in other words, which the doctrine of chances will not explain. So, inheritance is proven by finding the number of cases in which patients with phthisis have phthisical progenitors too large to be resolvable into coincidence or chance.

In 220 of my cases the histories contain information bearing on the foregoing questions. I shall first give the facts noted in a considerable number of cases in which two or more members of the same family (parents, brothers, and sisters), exclusive of the patient, or members of the family of the parents of the patient (grandparents, uncles, and aunts), were affected with phthisis.

Case 1. Both parents died with phthisis; and of 11 brothers or sisters, 4 only living, the others having died with phthisis.

Case 2. Mother died with phthisis. A brother of his father died with phthisis, and a brother of the patient had died with it.

Case 3. Parents living, but two sisters had died with phthisis.

Case 4. Had lost sisters and a brother with phthisis.

Case 5. Mother died with phthisis, and four other children, that is, either brothers or sisters of the patient, died with it.

Case 6. The patient was the last of 7 children, all of whom died with phthisis, between the age of 18 and 23. Mother died with phthisis. Father well and robust.

Case 7. Mother and two sisters of the patient died with phthisis.

Case 8. Of seven children, brothers or sisters of the patient, two, a sister and a brother, had died with phthisis.

Case 9. Mother had died with phthisis; father living but affected with the disease, and a brother of the patient had died with it.

Case 10. Both parents died with other diseases. Had lost two sisters with phthisis.

Case 11. Two sisters of the patient had died with phthisis. Parents living and well.

Case 12. The mother and grandmother of the patient had died with phthisis; also, two sisters of the patient. Two brothers were living and well.

Case 13. Had lost a brother and several sisters with phthisis. Father dead, but did not have this disease. Mother living at an advanced age.

Case 14. Mother died with phthisis. Two sisters had died with it. Subsequently two brothers died with it, and the only remaining children, two sisters, although living, have had the symptoms and signs of the disease. Five of these cases are in my collection. The father died with enteritis, at about the age of 60 years, and he was probably affected with phthisis.

Case 15. Father had had a chronic cough for several years, and a sister of the patient had died with phthisis.

Case 16. Both parents died with phthisis within a year.

Case 17. Patient had lost three sisters with phthisis. Parents living and well.

Case 18. Mother died with phthisis, and a brother and sister of the patient had died with it.

Case 19. Both parents died with phthisis.

Case 20. Father died with phthisis, and the patient had lost eight brothers with it.

Case 21. Mother living, but had a cough which had existed for a long time. Father well, but his grandfather died with phthisis. A sister of the patient had died with it.

Case 22. Father died with phthisis, and also an only brother of the patient.

Case 23. Mother died with phthisis, and the patient had lost a brother and a sister with it.

Case 24. Father, mother, and seven sisters had died with phthisis; these, with the patient, were all the children of this family.

Case 25. A sister and a brother had died with phthisis. Parents living and well.

Case 26. Mother died with phthisis, and father from pulmonary hemorrhage.

Case 27. Father, probably, died with phthisis, and a sister of the patient had died with it.

Case 28. Several brothers of the patient had died with phthisis.

Case 29. Mother died with phthisis at an advanced age, and a sister of the patient had died with it.

Case 30. Five sisters of the mother of the patient died with phthisis; the mother died young with choleraic dysentery. Grandparents lived to an advanced age.

Case 31. Both parents died with phthisis, and a sister of the patient had died with it.

Case 32. Father, mother, and a brother of the patient died with phthisis.

Case 33. Father died with phthisis, and four brothers of the patient had died with it.

Case 34. Mother died with phthisis. Two brothers and two sisters of his mother had died with it.

Case 35. Father, mother, three brothers, and a sister had died with phthisis, these, with himself, constituting the whole family.

Case 36. Two sisters of the patient had died with phthisis. One a twin-sister. Both parents died when the patient was young; one of pneumonia and the other of pleurisy.

Case 37. Mother and a sister of the patient had died with phthisis.

Case 38. Mother died with phthisis. A brother and a sister of the patient had died with it.

Case 39. Three sisters of the mother of the patient had died with phthisis. The mother and grandmother living and well. Father living and well.

Case 40. Both parents died with phthisis.

Case 41. Both parents died with phthisis. A brother and a sister have died with it; another brother is supposed to have it; these constituting the entire family. A brother of the father and a sister of the mother, living and well, each having grandchildren, none of whom have had phthisis.

Case 42. Father and two brothers of the patient died with phthisis.

Case 43. Mother and a brother of the patient died with phthisis.

Case 44. Several brothers had died with phthisis.

Case 45. A brother and sister of the mother died with phthisis. Both parents living.

Case 46. Several brothers and sisters of the mother of the patient had died with phthisis. Parents living and well.

Case 47. Two brothers of the mother of the patient had died with phthisis. Parents living and well.

Case 48. A brother of the patient's father, a grandfather, and three aunts, had died with phthisis.

Case 49. Three sisters of the mother of the patient died with phthisis. Both parents living.

Case 50. Two sisters of the patient died with phthisis. Two sisters living.

Case 51. A sister and an uncle of the patient had died with phthisis. Parents living and well.

Case 52. A grandmother and several other members of the family had died with phthisis. Both parents living.

Case 53. Both parents died with phthisis. Of six brothers and two sisters, none had had it.

Case 54. Both parents died with phthisis.

In the foregoing 54 cases, two or more members of the family, including under this term two successive generations, were affected with phthisis in addition to the patient. It is quite certain that this list does not include all the cases affording the same evidence of congenital tendency. As will be seen presently, in a number of cases it was simply noted that a family predisposition existed; doubtless, in some of these cases two or more members of the family, exclusive of the patient, had been affected. Again, it is probable, that, in some of the cases embraced in the foregoing list, pains were not taken to ascertain all the members of the family who had been affected. But, taking the list as it stands, 54 out of 220 cases is a proportion of nearly one-fourth, or a ratio of 24 per cent. Is there room for doubt that this result of the analysis cannot be accounted for by coincidence or chance? There might be ground for this explanation if the cases were few in number, but certainly not when they amount to nearly one-quarter of all the cases. The result, therefore, proves a congenital predisposition.

The number of cases in which many members of a family, inclusive of my patients, were affected with phthisis, strengthens the proof of a congenital predisposition. Thirteen of the 53 cases belong in this category, namely, Nos. 1, 5, 6, 10, 14, 20, 24, 30, 33, 34, 35, 41, 48. In two of these 13 cases (Nos. 6 and 14) an entire family, excepting the father—the mother with 7 children in one case, and the mother with 6 children in the other case—were affected with phthisis. In two cases (Nos. 24 and 35) both parents and all the children, the latter numbering in one case 8, and in the other case 5, were affected with the disease. In another case (No. 10) both parents and three sisters had it. In another case (No. 20) the father and nine children had it. In another case (No. 1) both parents and 7 of 11 children had it. In these 7 families there were 56 cases, and in the 13 families 91 cases.

Facts bearing on inheritance which were noted in the 54 cases are as follows: In 16 cases both parents were either living and free from the disease, or they had died with other diseases. In 10 cases both parents had had phthisis. In 6 cases the father and not the mother, and in 13 cases the mother and not the father, had had the disease. Facts were noted relative to the grandparents and the brothers or sisters of the parents of the patients in the following cases: Nos. 2, 12, 21, 30, 33, 39, 41, 46, 47, 49, 51, and 52. Without reproducing the details the study of the 54 cases with reference to inheritance develops evidence of the transmission of the diathesis for two successive generations. It also develops evidence of the transmission to grandchildren, the parents of the latter escaping; also, of the disease affecting one child and the offspring of this child, while others of the family and their children escaped (No. 41), and, finally, the diathesis may be congenital when there is no evidence of inheritance.

Eliminating the 54 cases just studied, the number remaining is 166. I proceed to analyze these cases with reference to congenital predisposition. In the histories of 51 of the 166 cases it was noted simply that there was no family predisposition to phthisis. In the histories of 17 cases it was simply noted that there was such a predisposition. In 38 cases it is simply noted that both parents were living. In 10 cases the fathers of the patients were affected with the disease, and in one of these cases it is noted that the father and several generations had had it. In 10 cases a brother of the patients had had it. In 5 cases a sister had had it; and in one case either a brother or a sister. In three instances two of my patients were brothers affected with the disease. A brother of the father of the patient had it in one case. A brother of the mother of the patient had it in one case. In 4 cases it is stated that no member of the families had had it; and in the remaining 4 cases it is noted as follows: the father living and the mother had died with some other disease than phthisis in 2 cases; in one case the mother died with cholera, the father living and well, and of several brothers and sisters of the patient none had had the disease; and in the other case both parents had died with other diseases, and of eleven brothers and sisters of the patient none had had phthisis.

The histories thus in 93 of the 166 cases are deficient in evidence of a congenital predisposition; that is, it is not noted that any relatives of the patients had been affected with the disease.

It is, however, to be remarked that the statements in the histories are in most cases rather indefinite. The statement that there was "no family predisposition" is not inconsistent with the supposition that in some of the cases (51) some relative or even relatives may have had the disease. This remark will apply still more to the cases (38) in which it was only noted that both parents were living. On the other hand, in the histories of 73 cases it was noted that the father, the mother, a brother, a sister, or some member of the family had had the disease. Were these 166 cases to be studied alone, a congenital and inherited predisposition would not be proved. Assuming that this has been already proved, it is important to take cognizance of the fact which is shown by the analysis of these 166 cases, namely, phthisis is developed in a considerable number of cases when there is little or no evidence of an innate diathesis. May not the diathesis be congenital, although evidence be wanting? The affirmative answer to this question cannot be proven; but it is rendered probable by the development of the disease without any appreciable external causative agencies. It may reasonably be conjectured that a predisposition may be inherent in the organism of persons none of whose relatives have had phthisis. Indeed, it may be that the diathesis always involves a congenital predisposition; that is, it is never wholly acquired. It would be useless to discuss this question. As an offset to the development of the disease when there is no evidence of congenital predisposition, the fact is not to be overlooked that when several or many members of a family have been affected with the disease, a certain proportion of the relatives escape. Even when the evidence of a family tendency is strong, it by no means follows that all the members are doomed. With reference to encouragement it is important to bear in mind this fact, as it is, also, important to take cognizance of a probable innate predisposition, in order, if possible, to prevent the development of the disease.

CHAPTER III.

SYMPTOMATIC EVENTS AND COMPLICATIONS.

Bronchorrhagia preceding and accompaning the development of phthisis—Exciting causes—Dependence on local congestion—Its occurrence without being accompanied or followed by phthisis—Propositions embodying conclusions from clinical studies—Hemorrhage in cavities—Death from bronchial and cavernous hemorrhage—Moral effects of hemorrhage—Relief of pulmonary symptoms an effect in some cases—Increase of disease after hemorrhage in some cases—Coagulation of blood in the bronchial tubes—Influence of bronchorrhagia on fatality, arrest, tolerance, recovery, and duration—Treatment of bronchorrhagia—Diarrhœa, its significance as respects intestinal lesions, its relations to other complications and to the pulmonary affection, its bearing on prognosis and on the duration of phthisis—Miscellaneous events referable to the digestive system; epidemic cholera, sporadic cholera, choleraic dysentery, gastric ulcer, peritonitis, pharyngitis—Laryngitis, its frequency and symptoms, its chronological relations to the pulmonary affection, its influence on the fatality and duration of phthisis, the prognosis as regards recovery from the laryngitis and the treatment—Lobar pneumonia as an intercurrent affection in phthisis, its influence on phthisis, its agency in causing death— Circumscribed pneumonia leading to error as regards the amount of the phthisical affection—Pleurisy with effusion, its agency in determining death in certain cases, and its influence on the progress of phthisis sometimes salutary—Perforation of lung with pneumothorax, symptoms denoting its occurrence, exciting causes, its occurrence after thoracentesis, the propriety of thoracentesis when the pleural sac becomes filled with liquid, the propriety of this operation when the accumulation of liquid air occasions much dyspnœa, the propriety of a free incision into the chest in phthisis with pneumothorax, cases illustrative of this procedure in perforation following emphysema, chronological relations of perforation to the commencement of phthisis and the subsequent duration of the disease—Pulmonary calculi—Pneumorrhagia and gangrene—Dorso-intercostal neuralgia—Latency of phthisis and the sudden evacuation of collections of liquefied morbid products, "tuberculous abscesses"—Affections of the heart and pericardium—Articular rheumatism—Disease of the kidneys—Thrombosis of the iliac veins—Angular curvature of spine—Cerebral meningitis—Perineal fistula, its significance and influence on the progress of phthisis—Pregnancy, its influence on the progress of phthisis—Clubbed fingers—Rosy complexion.

I DO not propose to study my cases with reference to data for the clinical history of phthisis. Of a considerable number of the cases, the notes are sufficiently full and complete to be made subservient to this end. I could analyze from one to two hundred cases with a view to ascertain the positive and negative facts respecting the various symptoms, such as cough and expectoration, appetite, digestion, nutrition, febrile movement, perspirations, pleuritic pains, etc. etc. It seems to me, however, that the importance of the object is not commensurate with the amount of labor which such a study would require. The disease is so common that all practitioners who have had even moderate opportunities for observation, are familiar with its symptomatology, and are able to estimate the import of different symptoms separately and in combination. Statistics showing the relative proportion of instances in which the various symptoms are present, severally, in fatal and nonfatal cases, would possess interest, but they would not have much value as shedding light on the pathology of the disease, or in any practical bearing. I shall, therefore, forego the labor, at least for the present, and I shall devote this chapter to the analytical study of my cases with reference to some symptomatic events which seem to me to be especially interesting and important, together with certain coexisting affections or complications. Prominent among the symptomatic events of phthisis is bronchorrhagia or hæmoptysis. I proceed to study this event under several points of view.

Bronchorrhagia. Hæmoptysis.

Hæmoptysis as an event antecedent to phthisis has been already studied (*vide* Chapter II., page 64). In a considerable number of cases (37) this event occurred prior to the establishment of the disease, at periods more or less remote, the longest interval being sixteen years. That the hæmoptysis is to be regarded in the light of a prodromic event, and that, when it precedes for months or years the development of phthisis, there is a pathological connection between it and the phthisical affection, are conclusions drawn from these facts. A pathological connection is especially shown by the fact that in a considerable proportion of cases hæmoptysis is the first appreciable symptom of the disease; persistent cough, with other evidence of the latter, dating from the raising of blood. As stated in the preceding chapter, this was noted in twenty-six cases, and it may have been true of a number of cases in which the fact does not appear in the recorded histories. In most of these cases, not only did the attack of hæmoptysis occur without having been preceded by cough and other pulmonary symptoms, but the health was apparently in all respects good at the moment when the hemorrhage took place. In a certain proportion of cases hæmoptysis occurs very soon after the commencement of cough. This is noted in sixteen of the cases in which the details of the early history were recorded. In the cases now referred to, cough had existed for only a few days or at furthest a few weeks. In most of the cases the antecedent cough was so slight as not to have excited much attention, and the health otherwise was apparently good when the hemorrhage took place. In the cases in which it occurred with, or very soon after, the commencement of cough, the hæmoptysis may fairly be considered as incidental to the development of the pulmonary affection. That it occurs once or repeatedly in the majority of cases, and sometimes a great number of times after the development of phthisis, at different periods during the progress of the disease, is sufficiently well known. I have not analyzed all my cases with reference to the number in which this event either occurred or was wanting; but, of 180 cases analyzed with reference to the influence of hæmoptysis on the termination and duration of the disease, hæmoptysis occurred in 99 and was wanting in 81 cases. In the great majority of cases hæmoptysis occurs repeatedly during the progress of the disease. This was noted in 70 of 96 cases. The number of repetitions varies within wide limits. The largest number which was noted among the cases in this collection was 40. So also, there are great differences as regards the duration of the hæmoptoic attack and the amount of the hemorrhage. A slight raising of blood, that is, the quantity limited to a few drachms, is comparatively rare; I have noted it in only 11 of 96 cases, whereas, the hemorrhage was profuse in 50 of these cases. The repetitions may occur at short intervals, perhaps several times in a day and for many days in succession, or the recurrence may be after weeks, months, or years; and the expectoration of blood may be for an instant only, or it may continue for hours. My cases furnish examples of these facts. In most instances, attacks of hæmoptysis are not preceded by any obvious circumstances which can be considered as causative. In twenty-one cases, the absence of any apparent cause is noted, the attack occurring in eight of these cases either after retiring to bed at night or before rising in the morning. In general, it is fair to infer from the absence of any statement with reference to suspected causes in the histories, that there were none. Patients naturally are led to seek for a cause, and not infrequently seize upon something which they think may have occasioned the hemorrhage. In some of these instances there is reason to think that the attacks may have been determined by exciting causes. I have noted circumstances which it was suspected might have had a causative influence in twenty-four cases. In three of these cases the attack was during or directly after a cold bath. In one case it was after preaching, the patient being a clergyman, cough having existed for some time. In one case the patient, a physician, who supposed himself to be at that time perfectly well, after violent exercise in pitching hay, had on the following night headache and fever, and three days afterward, having ridden ten miles during the day, he had an attack in the evening. In another case, the patient, also a physician, an attack took place while he was engaged in pitching hay, his health at the time being apparently perfect. Three patients attributed an attack to efforts of lifting; in one of these cases, as the patient stated, he was sensible of some injury within the chest, but the hemorrhage did not occur until several days afterward. One patient had made a political speech in the open air the day before the attack. In one case the attack was during a scuffle on a canal boat. A patient, who had had a cough for some time, attributed the hemorrhage to his having received a heavy blow on the back of the head the previous day. In one case the attack occurred when the patient was dancing, there having been no previous evidence of disease. In another case the attack took place at night, the patient having danced during the preceding evening and marched as a volunteer soldier during the day. The attack occurred in one case during a paroxysm of cough excited by the inhalation of dust, there having been previously no evidence of disease. One patient attributed the attack to a shock caused by jumping from a buggy; and another to a fall on the ice, the attack in the latter case occurring during the following night. One patient thought the hemorrhage was due to playing the clarionet, although the attack did not follow any unusual effort in that way. In one case the attack was in the evening after considerable exposure to cold and fatigue during the day. In one case the hemorrhage took place during violent laughter, the health being apparently excellent. The attack in one case was during the cold stage of a paroxysm of intermittent fever. In one case the hemorrhage was on the day following an injury of the chest, chronic pleurisy being produced apparently by the injury, and phthisis occurring four years afterward. In one case three successive attacks were at the catamenial period; and in another case an attack was at the commencement of menstruation. Doubtless, in some of the foregoing instances there was no causative connection between the circumstances named and the hæmoptysis; and, assuming that there was such a connection in other instances, with two or three exceptions, it would be unreasonable to attribute to the circumstances any agency beyond that of an exciting cause, in other words, the hemorrhage involved an existing predisposing cause, and the circumstances simply determined the time when the hæmoptysis occurred.

Of what local morbid condition is the bronchorrhagia the immediate effect? The foregoing facts lead to this question. The immediate causative condition must be local, for if it were a blood-change, or any general condition, it may be assumed that the hemorrhage would not be limited to the bronchial mucous membrane. In purpura hemorrhagica, yellow fever, and other affections in which hemorrhage proceeds from either a morbid state of the blood or of the vascular system, hæmoptysis is comparatively rare. The local condition is neither a circumscribed bronchitis nor a pneumonia, for an expectoration of pure blood, that is, without mucus, does not belong to the clinical history of these affections. The theory of hemorrhagic infarctus will not account for the hemorrhage, because hæmoptysis is not a symptom in cases in which infarctus is ascertained to have existed. The most rational supposition would seem to be that the hemorrhage is an effect of hyperæmia or congestion of a section of the bronchial mucous membrane. An instance in which this was proved after death (Chapter I., page 41), sustains this supposition. If this be the local condition, is the congestion active or passive, and what is the pathological connection between it and the tuberculous affection? These questions are to be answered, if answered at all, either by conjecture or by conclusions drawn from clinical facts. With reference to the latter question, it is desirable to determine whether the congestion precede, accompany, or follow the development of tuberculous disease. I will study the clinical facts in my cases as bearing upon this point.

Reverting to the fact shown in Chapter II., namely, that, in a considerable number of cases, hæmoptysis occurs without having been preceded, and without being followed immediately by cough or other pulmonary symptoms, but phthisis becoming established after periods more or less remote, is it probable that in these cases the hemorrhage occurs concurrently with a small affection which at once ceases—as it were, aborting? The affirmative answer to this question is not improbable. The frequency with which, in post-mortem examinations of bodies dead with various diseases, obsolete tubercles or traces of phthisis are found, suffices to prove that an affection may be extremely limited, and cease without further development or progress. The absence of pulmonary symptoms is not positive evidence against the existence of a small affection, for these symptoms are sometimes wanting when physical signs show that even a considerable affection exists. That there may be scattered tubercles in the lungs when their presence is not revealed by auscultation and percussion, must be conceded. Taking now into consideration the cases in which hæmoptysis is the initial symptom of disease, cough and other symptoms following directly after this event, it is a rational supposition that the congestion supposed to give rise to the hemorrhage is a primary effect of the development of phthisis.

This seems the more rational when it is considered that, in the majority of cases, hæmoptysis is an event occurring after an affection is declared by other symptoms and by signs; and in these cases it may be rationally supposed that congestion is still a primary effect of the development of phthisis, since it is well known that during the progress of phthisis, successive epochs of its increase, or, as it were, new developments of it, are apt to take place. It is to be considered that, in most instances, the hemorrhage does not occur in connection with any circumstances which can be regarded in the light of even exciting causes. And, again, it is to be considered that a local congestion implies a local causative condition of some kind; in other words, the occurrence of a local congestion as a primary condition is improbable. Moreover, that the local affection involves a local hyperæmia, is rendered probable by the fact that, in general, it occasions a circumscribed bronchitis, believing, as clinical observation warrants in doing, that the cough and expectoration in early phthisis proceed from a secondary bronchial inflammation. Accepting, as a conclusion justified by clinical facts, that hæmoptysis is in general an effect of a local congestion induced by the primary local affection in phthisis, this congestion is probably active, that is, the hyperæmia is due, not to venous obstruction, but to an undue determination of blood to the congested portion of the mucous membrane.

An explanation which has been offered of the dependence of hemorrhage upon tubercles is as follows: the primary seat of tubercles (granulations) being the small arteries, the coats of the latter are thereby weakened, and rupture is, in consequence, liable to take place. Another explanation is, the production of tubercles leads to the occlusion of small vessels, and hence the pressure of the blood in the proximate unobstructed arteries (collateral fluxion) leads to rupture.

In my collection of cases, bronchorrhagia, when it occurred, invariably either preceded or accompanied phthisis. But the inquiry is here pertinent, has this event always a pathological connection with phthisis, or, to vary the expression, does hæmoptysis occur when it neither accompanies nor is followed by an obvious development of disease? Of course, this inquiry relates only to cases in which hemorrhage is limited to the bronchial mucous membrane. It is proper to exclude cases in which hæmoptysis is a symptom of mitral cardiac lesions. Cases in which the hemorrhage is due to injuries of the chest, and the rare instances of bronchial hemorrhage occurring vicariously in place of the menstrual discharge, should also be excluded. Louis, having questioned for nearly three years every patient coming under his observation affected with various diseases other than phthisis, and finding that not one had ever had spitting of blood, excepting when it was attributable to either injury of the chest or suppressed menstruation, concluded that, excluding the causes just named, a bronchial hemorrhage rendered the existence of tubercles in the lungs "infinitely probable." The statements of Niemeyer are in striking contrast with the conclusion of Louis. According to Niemeyer, "In the very great majority of cases in which the first attack of hæmoptysis has not been preceded by either cough, dyspnœa, or other signs of pulmonary disorder, the lungs are free and by no means the seat of tubercular deposit, at the commencement of the bleeding."[1] This author affirms that "Bronchial hemorrhage occúrs oftener than is generally believed in persons who are not consumptive at the time of the bleeding, and who never become so."[2] He held the opinion that copious bronchial hemorrhage frequently precedes consumption, without any relation of cause and effect; in these cases the bleeding and the consumption proceeding from a predisposition to both. This opinion implies a pathological connection between the two. Again, he believed that bronchial hemorrhage in certain cases was the cause of phthisis, leading to chronic inflammation and destruction of lung. This last belief has been referred to in the preceding chapter, and will be noticed again presently, in considering the immediate effects of bronchial hemorrhage. That hæmoptysis occurs in the early life of persons who live to an advanced age, and in those who at length die of some other disease than phthisis, is certain. The statistics of Ware showed such cases to be not very infrequent. My own records contain a number of instances. In some of these cases the symptoms and signs at the time of the hemorrhage showed the existence of phthisis. These, therefore, are cases of arrest and recovery from this disease. In a certain proportion of cases, however, the symptoms and signs of phthisis, either with or following hæmoptysis, are not discoverable. But in the latter cases there is always room for the conjecture, if not belief, that the hemorrhage was associated with latent phthisis, which not progressing, the disease, as it were, aborted. I have heard it stated by some physicians of experience in the department of thoracic diseases, that they could recall no instances of hæmoptysis, exclusive of injuries, of diseases in which hemorrhage from other mucous surfaces took place, of vicarious menstruation, and affections of the heart, in which they had not been able to make out physical signs sufficient for the diagnosis of phthisis. I am well aware that an adept in physical exploration may discover adequate evidence of the disease when others with less experience and skill will fail, but I am sure that there are cases, although by no means numerous, in which, with ever so much practical ability in auscultation and percussion, positive signs are not determinable. As bearing upon the inquiry under consideration, post-mortem examinations in cases in which bronchial hemorrhage has occurred without the evidence of phthisis are especially important. It is desirable that the examinations should have been made soon after the occurrence of the hemorrhage, for, if much time elapse, there is room for the supposition that some tubercles may have existed and all traces of their existence have disappeared. But a bronchial hemorrhage proves fatal in so small a number of cases that the opportunity for an examination after death is very rarely offered soon after the occurrence of hæmoptysis. In Niemeyer's work, referred to above, the author says: "I have repeatedly failed to find *post-mortem* traces of pulmonary tubercle, or of any other destructive disorder in the lungs of individuals who have died suddenly of pneumorrhagia (bronchorrhagia?) while in the enjoyment of apparent health." This statement would carry with it much more force if the number of examinations under these circumstances had been given. The same author states that "patients nearly always survive the attack," and hence it is fair to conclude that his examinations must have been very few. The opportunity of examining in a fatal case in which death was due to bronchial hemorrhage, the signs and symptoms of phthisis being absent, has not offered itself to me, although I may fairly assume that my field for observation has been very much larger than that of Niemeyer. The following case, however, is instructive from the fact that the post-mortem examination was not very long after the occurrence of hæmoptysis, and careful physical examinations of the chest were made and noted at the time of the hemorrhage and subsequently.

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[1] Text Book of Practical Medicine.

[2] Ibid.

Dr. S. had an attack of hæmoptysis, July 23d, 1867. Three days afterward I made an examination of the chest, and found only some relative feebleness of the respiratory murmur, with slight sub-crepitant rales in the left infra-clavicular region. The hæmoptysis occurred when he was quiet; it was not preceded nor followed by cough, and he considered himself well at the time of its occurrence. His duties confined him in the hospital dead-house and the dissecting-room. My advice to him was to act as if the hæmoptysis were a forerunner of phthisis. In accordance with this advice, he suspended his labor and went to

Europe. He returned in the following October, having gained in weight, and apparently being in perfect health, excepting that in the morning he had a little cough and slight expectoration. On an examination of the chest now, some feebleness of the respiratory murmur in the left infra-clavicular region, together with a little elevation of pitch, was found, and no rales. Dr. S. died in December, 1869, from a complication of affections not involving the pulmonary organs. The lungs carefully examined, *post-mortem*, showed no trace of phthisis. At the summit of the left lung there was some depression from thickening of the pleura.

I have a memorandum of a case of sudden death attributed to bronchial hemorrhage, with the autopsy, reported by Dr. George N. Burwell, of Buffalo, N. Y., to a medical society in 1847. The patient was a corpulent man, and an habitual beer drinker. He had been ill for several days, complaining first of some stitch-like pains in the chest, which were relieved by sinapisms, together with a little cough and expectoration, these symptoms being associated with tremulousness of the tongue and limbs, so that Dr. Burwell was led to expect delirium tremens. He was suddenly siezed with hæmoptysis, and died within a few moments. Dr. B. estimated that he raised nearly two quarts of blood, and a large quantity was found after death in the stomach. The lungs presented no apoplectic extravasations (pneumorrhagia), but they were intensely congested, and the bronchial mucous membrane was exceedingly so. There was small effusion into the serous cavities. The condition of the heart and arteries is not noted, but it is to be inferred from this omission that there was no cause for the hemorrhage found in the vascular organs.[1]

I have noted several cases in which bronchial hemorrhage either continued to recur daily or was repeated at intervals for a long time without the physical signs or other evidence of pulmonary disease. I shall introduce in this connection a brief account of these cases:—

Case 1. Mr. B., aged thirty-five, ship carpenter, was referred to me for an examination of the chest by Dr. Hawley, of Green

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[1] This was reported as a case of bronchorrhagia. There may be room for the conjecture that it was a case of gastrorrhagia.

Point, Long Island, July, 1862. During the greater part of the preceding six months (he estimated the proportion to be seven-eighths) he had raised more or less blood daily. The quantity *per diem* varied, sometimes amounting to half a teacupful. He raised it by an act of coughing, not hawking. He was not subject to epistaxis. Evidently the blood came from the bronchial mucous membrane. Aside from the hæmoptysis, he had no cough nor expectoration. His aspect was not morbid, and he had not lost in height. He had had, however, intercostal neuralgia, and was below par as regards strength. He had worked very hard for two years, some of the time working in the night as well as the daytime. I examined the chest carefully, with a negative result as regards disease of lungs and heart. I advised the persulphate of iron, with a respite from work, and recreation in the country. He saw me again in March, 1863. He went into the country for two weeks during the preceding summer, and returned with improved health, but he had until quite recently continued to raise more or less blood almost daily. I repeated an examination of the chest, with a negative result as before. During the greater part of the time since the previous consultation, he had taken no remedies. The hemorrhage did not return after the last date, and ten years afterward I heard of him as having had, and as then having, robust health.[1]

Case 2. Miss D., aged about twenty-two, came under my observation, in consultation with Dr. C. R. Bogert, in January, 1866. Hæmoptysis had recently occurred, and had continued, a little blood being raised daily. She was quite stout, and her countenance was healthy. An examination of the chest was negative. The spitting of blood daily, in small quantity, continued, and in the following March, by the advice of Dr. Bogert and myself, she went to Europe. She was examined in London by the late Dr. Hyde Salter, who found only a prolonged and somewhat tubular expiration at the right summit, especially above the clavicle. This is common enough in healthy persons. She returned in the latter part of the summer of 1866, and was examined by Dr. DaCosta, who failed to find any positive signs of pulmonary disease. An examination by means of the laryngoscope showed no morbid appearances. Meanwhile, the recurrence of slight hæmoptysis almost daily continued. I examined the patient again in December, 1870, with a negative result. The hemorrhage still persisted, recurring at short intervals, and always slight. She had made voyages and travelled much during the preceding four years with a view to health. Her nutrition was good, and the general aspect healthy. She had no habitual cough nor expectoration. She was subject to "fainting turns," which were evidently hysterical.

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[1] I saw this person to-day, October 21, 1874, and he has robust health.

Case 3. My notes of this case were made in July, 1858. The patient was a widowed lady aged fifty-two. The first attack of hæmoptysis was twenty-three years prior to that date. From that date in every year the hæmoptysis had recurred. She thought she had had at least forty attacks. I had made an examination of the chest twelve years before the date of my notes, with a negative result. The attacks of hemorrhage were never preceded nor followed by cough or any pulmonary symptoms. Generally the quantity of blood raised was small, but on one occasion the hemorrhage was repeated for several successive days, and the amount of blood lost was large. The heart was free from evidence of disease, and her general health was good, although she presented a delicate appearance. The subsequent history of the case is wanting.

Case 4. A few weeks prior to the present time (June, 1873) I visited, in consultation with Dr. George A. Peters, a married lady aged about thirty-five years. For fifteen years, or longer, this lady had been subject to attacks of hæmoptysis. The quantity of blood raised was sometimes profuse. Examinations of the chest made repeatedly by Dr. Peters and others were always with a negative result. This was the result of my examination as regards both the lungs and heart. She was affected with renal disease, and died with uræmia. There was no *post-mortem* examination.

Case 5. Judge C., aged sixty-seven, consulted me, August, 1858, having been referred to me by Dr. Saunders, of East Randolph, New York. The patient was a man of very active habits, being largely engaged in business in addition to his judicial duties. He was a free liver, habitually drinking spirits, but within moderate bounds. He had always had good health with these exceptions: Six years before seeing me he had an apoplectic seizure with hemiplegia, from which he recovered completely, and four years before he had hæmoptysis. The raising of blood then persisted for several months, his general health being good, and finally the hemorrhage ceased. Meanwhile he remained apparently well, until about two months prior to seeing me, when the hæmoptysis returned. He raised blood in small quantity repeatedly during each day. Aside from this, there was nothing to denote ill health. He was quite corpulent, weighing two hundred and thirty pounds. An examination of the chest furnished no signs of pulmonary or cardiac disease. In the following month, Dr. Saunders wrote to me that the hæmoptysis continued. Dr. S., in reply to a letter of inquiry, informs me that this patient died in 1867 while attending court. His age at the time of his death was seventy-four. He continued to raise blood from time to time up to his death, there being no physical signs of pulmonary disease. His general health, moreover, was good, and he continued in active business up to a few days before his death, when he was attacked with paraplegia and afterward with some cerebral affection.

Case 6. I. S., aged thirty-five, had an attack of hæmoptysis first in August, 1872, neither preceded nor followed by cough. In February, 1873, he had another attack; and after that date, up to the time of seeing me, August, 1873, he had raised daily more or less blood. The quantity raised on some days had been considerable. He had considerable mucous expectoration. He had lost but little in weight, and his aspect was healthy. His business was that of a porter, and he had continued to do light work. An examination of the chest was negative as regards the lungs and heart, except that slight subcrepitant rales were heard over the right scapula. The subsequent history is unknown.

Case 7. Mrs. V., aged thirty-five, was examined by me, in consultation with Prof. Lewis A. Sayre, in May, 1862. She had been married eighteen years and had had eight children, the youngest being nineteen months old. Until within the preceding eight months her health had always been good. Her illness began with either menorrhagia or an early abortion, the flooding being so great that her life was considered to be in danger. She had been in ill health since that occurrence. She had had intermittent fever during the preceding winter. The menses recurred regularly, but the loss of blood was excessive. In the intervals between the menses for several months she had raised daily a bloody liquid, the average quantity *per diem* estimated to be about half a teacupful. The appearance was that of sanguinolent serum rather than of pure blood. She had not at any time any mucous expectoration; there had been, however, and was still, considerable cough connected with the bloody expectoration. She had intercostal neuralgia affecting the right side. The appetite and digestion were good. She had an anæmic aspect. A careful examination of the chest disclosed no signs of either pulmonary or cardiac disease. There were no manifestations of hysteria in this case. She was treated with chalybeate tonics, and hygienic measures having reference to anæmia. Under this treatment she recovered, and I have noted in August, 1866, that she was in good health.

Case 8. E. K., aged forty-five, builder, consulted me in January, 1874. During the preceding three years he had had repeated attacks of hæmoptysis, the last attack two weeks previous, when he raised, as he thought, half a pint of blood. He had no habitual cough, and his aspect was healthy. He was about 15 pounds under his best weight of health. An examination of the chest was negative as regards disease of heart and lungs.

Case 9. Mrs. W., aged forty-five, had had several children, the youngest being three years of age. The menses had not occurred for several months. Her parents had died at an advanced age. She had been subject to cough since she was eighteen years of age. During the preceding four or five years she had had repeated attacks of hæmoptysis. She estimated the number of attacks to have been from fifteen to twenty. She had had four attacks during the preceding year. She stated that she always felt better after a hemorrhage. The hemorrhage had never been profuse, rarely exceeding a teacupful, and generally less than this. Her aspect was delicate, but she had held her own as regards weight and strength. An examination of the chest furnished no signs of disease of heart or lungs.

I have referred to cases in which persons have reached an advanced age, free from pulmonary disease, who in early life had bronchial hemorrhage. In illustration of this I will give a brief account of some instances within my knowledge, of which I have preserved notes.

Case 1. Dr. C., when a student of medicine in 1834, had copious hæmoptysis followed by cough. He settled first as a practitioner in a western city, where his health was tolerable, but he had still some cough. He removed to Louisiana at the end of three years, and in 1859, after a lapse of twenty-five years, was engaged in practice and in excellent health.

Case 2. In September, 1859, I made the following memorandum: "The father of Dr. S., now living in good health, over seventy years of age, in early life had repeated attacks of bronchial hemorrhage, with cough and other symptoms denoting disease of the lungs. He went from the city into the country, in New England, lived out of doors, and for a time restricted his diet, in a great measure, to mush and molasses."

Case 3. Mr. W., in 1847, had an attack of hæmoptysis. He was then in the practice of law, and the hemorrhage occurred while he was examining some law papers, after having ran briskly up a pair of stairs. The quantity of blood raised was not large. He had had no cough, and none followed the hemorrhage. He was much alarmed, and at once relinquished his profession, adopting a business which required him to be much of the time in the open air. He had no recurrence of the hemorrhage, and has never had any other symptom of pulmonary disease. My memorandum of this case was made thirteen years after the occurrence of the hæmoptysis. Twenty-eight years have now elapsed (1875), and he is now in good health.

Case 4. Dr. H. informed me, in 1862, that when a young man he had repeated attacks of hæmoptysis, in some of which the hemorrhage was profuse. I made a memorandum at that time. He was then about fifty years of age, in excellent health, and engaged in medical practice. He is still (eleven years after my memorandum) living and well.

Case 5. In the autumn of 1861, Dr. R., then forty-nine years of age, was attacked with hæmoptysis. At the time of the attack he was entirely free from any pulmonary symptoms, and was apparently perfectly well. To use his language, "Had a person come in and shot me with a pistol, I should not have been more astonished than I was at the occurrence of the hemorrhage." It occurred first in the afternoon, when he was quiet; it recurred in the evening, and in the following night of the day but one after the first attack. The quantity in each attack was small. The day after the two last attacks he went about his business as usual, being very actively engaged in medical practice. After these attacks he had for some time a dry, hacking cough. Aside from this, there were no indications of ill health. The summer following he went to Europe, returning to his practice in the autumn. He has since repeated the visit abroad. He is now in active practice, and in good health.[1]

Illustrations like these might be multiplied. Almost every physician is cognizant of cases in which persons more or less advanced in life, and free from any evidence of pulmonary disease, have had, in past years, hæmoptysis, either with or without other symptoms pointing to phthisis. Such cases afford a substantial basis for the encouragement of patients in the state of mental apprehension which is generally occasioned by the raising of blood.

Reverting now to the foregoing clinical facts, the following propositions embody conclusions which seem to be therewith consistent:—

1. Hæmoptysis, the hemorrhage limited to the bronchial mucous membrane, and not dependent on disease of the heart, or on an injury of the chest, is always presumptive evidence of existing pulmonary disease.

2. With the foregoing qualifications, the occurrence of a bronchial hemorrhage, if there be no other evidence of existing pulmonary disease, renders it extremely probable that, sooner or later, phthisis will become declared.

3. In most cases, at the time when the hæmoptysis occurs, the physical signs of pulmonary disease are to be discovered by the careful and skilful employment of auscultation and percussion.

4. Hæmoptysis occurs in some cases when not only the symptoms of pulmonary disease are wanting, but the result of physical explorations of the chest is negative. In a certain proportion of these cases it is probable that the hemorrhage is connected with a small affection which is latent as regards both symptomatic phenomena and physical signs.

5. In view of the foregoing propositions, prudence dictates that, in the cases in which hæmoptysis is the only evidence of

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[1] He has since died with cancer of the liver.

pulmonary disease, it is wise to act as if phthisis either exists or is impending.

6. Bronchial hemorrhage in some cases occurs, and it may recur frequently and persistently for a long period, without any apparent pathological connection with phthisis.

7. The pathological condition standing in immediate causative relation to bronchial hemorrhage is a hyperæmia or congestion limited to a section of the mucous membrane.

8. Whenever, as is true in the majority of cases, this local congestion has some pathological connection with phthisis, it is probable that the latter is the primary morbid condition, the hemorrhage being incidental to it.

Thus far, in considering hæmoptysis, or the raising of blood, the hemorrhage has been assumed to be bronchial, as denoted by the term bronchorrhagia. But bronchial hemorrhage does not exist in all cases of hæmoptysis occurring in connection with phthisis. The bands of pulmonary tissue which so often are found traversing tuberculous cavities, are liable to rupture, and, as they contain bloodvessels, blood may escape sometimes in a large quantity from the ruptured ends. This is the source of the hemorrhage when hæmoptysis occurs in advanced phthisis. At this period bronchial hemorrhage is rare; it is a symptom which belongs chiefly in the early part of the clinical history of the disease. The cavernous hemorrhage, as it may be called, may be so profuse as to prove the immediate cause of death. Of this fact the following case is illustrative: On entering on duty at Bellevue Hospital, August 1, 1861, I found a female patient, aged twenty-two, who was raising blood. The hæmoptysis was then moderate. Physical exploration showed an affection at the summit on the left side. The respirations were not much accelerated. She was comfortable as regards her general condition, and she was assured that the hemorrhage was not a serious event. She continued to raise blood daily in moderate quantity until August 12, when it became quite profuse. Prior to this date, she had been treated with gallic acid and krameria, but on this date, in addition, cold applications were made to the chest. From this date the hæmoptysis was slight, but in other respects her condition was much altered for the worse. The pulse and the respirations became frequent, and on the 17th of

August, when the record was first made, the pulse was 130 and the respirations 80. The prolabia were not livid but pallid. On this date the following signs were noted: Marked dulness on percussion over the upper and middle third of the left side of the chest; the respiratory murmur drowned in moist bronchial rales, and these rales also on the right side of the chest. Death took place August 18th. On examination after death a large cavity was found at the upper part of the left lung filled with coagula. With this cavity communicated one smaller, which was also filled with coagulated blood. It was estimated that the two cavities contained at least half a pint of coagula. Disseminated tubercles existed throughout the left lung, and, also, together with a small cavity, in the upper part of the right lung.

The following case affords another illustration of death from the loss of blood, the hemorrhage taking place within a cavity.

The patient was a male, aged thirty-five. On being told that he had consumption he asked for his discharge, and was about leaving the hospital, when profuse hæmoptysis occurred. He kept the bed several days, and then was again up and about the ward, when a second attack of hæmoptysis occurred. He rallied from this, and had a third attack as he was again about to leave the hospital. In a few days a fourth attack occurred, and death took place, evidently due to the loss of blood. These several attacks occurred within a period of three weeks. A cavity in this case was localized by the cracked metal resonance and the cavernous respiration, the signs of solidification existing around the site of the cavity. The *post-mortem* examination showed the greater part of the right lung to be solidified, and near the apex a cavity of about the size of an English walnut. The cavity was near the surface; it was anfractuous, and contained some bands. It was partially filled with sanguinolent serum and coagula. The left lung contained some nodules. The patient was not greatly emaciated.

As already stated, in cases of bronchial hemorrhage the loss of blood is very rarely the immediate cause of death. In my large collection of recorded cases I find only two instances, as follows:—

A boy, aged fourteen, came under my observation, in consultation, January 17, 1839. Six weeks prior to this date he had the first attack of hæmoptysis; three weeks after this a second attack occurred, and a third just previous to my visit. Dulness on percussion and moist rales were found in the right infra-clavicular region. He was treated by venesection which was practised three times, together with leeches to the chest, digitalis, antimony, and pustulation by means of the latter applied to the chest. On February 11 he died in an attack of hæmoptysis, death being apparently caused by suffocation. There was no examination after death.

In November, 1865, I visited with the late Dr. Stone, of West Farms, Westchester County, N. Y., a young lady who had had, for several days, daily recurrence of hæmoptysis. The evidence of tuberculosis was unequivocal, but the signs denoted a very small affection. The hemorrhage had been profuse, and the patient was blanched from the loss of blood. Shortly after my visit Dr. Stone informed me that profuse hemorrhage took place during the three days following my visit, when the patient died, apparently from the loss of blood. There was no examination after death in this case.

These two cases illustrate the two modes in which bronchial hemorrhage may be the immediate cause of death, namely, by suffocation and by syncope. In the first case, life was destroyed by the obstruction caused by the flooding of the air tubes; at least this was the inference drawn from the symptoms. In the second case the action of the heart ceased in consequence of the prolonged abundant bleeding.

We come now to the study of the apparent immediate and remote effects of bronchial hemorrhage. The study of the apparent effects, or, more properly speaking, the import of this event as regards the sequels either proximate or more or less distant, embraces, *first*, a comparison of the condition of patients directly before and after the hemorrhage, and, *second*, the rate of mortality and the duration of the disease in the cases of phthisis in which hemorrhage occurs, as compared with the cases in which this event is wanting. I propose to analyze my cases with reference to these two points of inquiry, taking up first the immediate apparent effects on the condition before and after hæmoptysis.

Hæmoptysis, more especially when it occurs for the first time, and either the hemorrhage is profuse or the attacks are repeated after short intervals, usually gives rise to moral effects which are more or less morbid. A bronchial hemorrhage causes more mental excitement and apprehension than the flow of blood in any other situation. It is a popular notion that the raising of blood is attended with immediate danger, and that it signifies consumption. The apparent prostration is often in a great measure or chiefly due to the condition of the mind under the belief that the event is serious and of grave omen; the patient fancies a great degree of exhaustion even when the amount of blood lost is not large; there is often a tendency to exaggerate the quantity raised; there is great anxiety to have the hemorrhage arrested, and physical exertions are avoided as much as possible lest the bleeding be continued or renewed. The mental state may impair or destroy the desire for food, and, moreover, remedies taken with a view to arrest the hemorrhage may co-operate in producing this effect. Consequently, when the hæmoptysis ceases, and after sufficient time has elapsed for the fear of a renewed attack to be measurably dispelled, the actual weakness of the patient is much greater than is to be accounted for by the loss of blood. This is shown by the fact that sometimes persons who have repeated attacks of hæmoptysis become so accustomed to their occurrence as to suffer little or no mental disturbance, and, under these circumstances, there may be no appreciable morbid effects. I have known of repeated instances in which attacks of hæmoptysis did not interrupt the usual active occupations. It may be stated, then, that bronchial hemorrhage, in a certain proportion of cases, is not followed by any appreciable morbid effects of importance. This statement will apply, not only to cases in which the hemorrhage occurs and there is no development of phthisis for months or years, if ever, but also to instances of hæmoptysis occurring after well-marked disease has taken place. To repeat, bronchial hemorrhage, exclusive of mental disturbance, may be followed by no other apparent immediate effects than those which are attributable to the loss of blood, and these may be inappreciable.

But hæmoptysis, as has been seen, in a considerable proportion of cases is the first appreciable event in the development of phthisis; cough and other symptoms denoting tuberculous disease immediately follow the raising of blood. Is the development of phthisis in these cases in any measure an effect of the hemorrhage? The foregoing statement opposes an affirmative answer to this question; and, in a previous connection, considerations have been adduced which render it probable that the hemorrhage in these cases is incidental to the tuberculous affection. This view is sustained by the following fact: Hæmoptysis, occurring after the development of phthisis, or associated with other symptoms showing the existence of disease, is not infrequently followed by a sense of relief and other evidence of improvement. In illustration of this fact I cite from my cases the following instances:—

Case 1. A girl, aged seventeen, in March had hæmoptysis. For some time prior thereto she had had cough. The cough ceased soon after the hemorrhage, and returned in the July following. At that time, when she came under my observation, the symptoms and signs afforded unequivocal evidence of phthisis.

Case 2. Mr. K., cotton planter in Mississippi, came under my observation January 27, 1860. Cough had existed for six months and chronic laryngitis for about the same period. Physical exploration showed a considerable affection at the summit of the left lung. Hæmoptysis had occurred for the first time ten days previous to his seeing me. After this event the cough had been less, and he felt better in all respects. He had had no medical treatment, but, of his own accord, he had lately taken cod-liver oil jelly, keeping about his business as usual. In a letter written on the 10th of the following June, he reported that he was free from cough and apparently well.

Case 3. Miss B., aged about twenty-two, in January, 1862, having recently had some cough which she attributed to a cold, was attacked with hæmoptysis, the quantity of blood passed being small. She had lost two brothers and two sisters with phthisis. The cough had ceased a few days before the hæmoptysis. It did not return after the hemorrhage, and, excepting mental disturbance, she was as well as usual. An examination of the chest gave the following signs: dulness at the right summit greater than belongs to health; the respiratory murmur in this situation weakened; the inspiration attended with crackling and the vocal resonance increased. There was no further development of disease, and the person has ever since (eleven years) had fair health.

Case 4. Mr. O. consulted me in February, 1862. Cough had existed for two years, but for a year it was slight, and he thought little of it. He had a slight hemorrhage during this year. In March, 1861, he had a profuse hemorrhage, and afterward repeatedly attacks comparatively slight. He stated that the pulmonary symptoms were always relieved after a hemorrhage. When I saw him he was in advanced phthisis, and his death took place soon afterward.

Case 5. Mr. T., aged twenty-three, clerk, consulted me in Oct., 1868. In May, 1868, he had a profuse hemorrhage. Cough had existed for several weeks, with loss in weight. The cough had greatly diminished since the hemorrhage and was now insignificant. He had passed the summer in the country and gained in weight. The following signs showed a small affection: Dulness of the right summit of the chest, weakened respiratory murmur, increase of vocal resonance and of bronchial whisper, crackling with inspiration, and undue transmission of the heart-sounds.

Case 6. This case is not included in my collection in consequence of there having been no physical examination of the chest. Dr. W., during the winter and spring of 1853, had repeated attacks of hæmoptysis, the hemorrhage being small. Prior to the first attack cough had existed for some time with some expectoration. The cough and expectoration disappeared after the hemorrhage. This was in January. In February he had another attack, preceded by cough and expectoration, and these symptoms immediately disappeared after the hemorrhage. In April the cough returned without expectoration, but disappeared shortly after a change of climate from Buffalo, N. Y., to Harrisburg, Pa. In May he had a third attack not preceded by cough. This attack was followed by slight cough and expectoration of short duration. He is now living and well, fifteen years after the case was noted.

In the preceding chapter I have thrown out the conjecture that bronchial hemorrhage may in some cases be conservative as regards the development of phthisis. Assuming that the hemorrhage is coincident with an affection which is so slight as not to give rise to appreciable physical signs, it may be perhaps preventive of its further progress at that time. Cases such as No. 4 of those just cited are suggestive of this supposition. The following case, inadvertently not included in my collection, has an analogous signification:—

Mr. S., aged twenty-three, consulted me in March, 1859. Two months previously, when apparently in perfect health, he was awakened at night by the occurrence of hæmoptysis. During each of the next six days he raised blood profusely. He thought the quantity must have amounted to several quarts. Afterward, for several days, he raised some mucus tinged with blood. No recurrence of the hæmoptysis had taken place. There was a little expectoration of mucus in the morning. He had lost not more than a couple of pounds in weight. Physical exploration, the details of which are fully noted, gave the following signs of pulmonary disease: The percussion-note at the left summit in front was raised in pitch, and slight dulness was evident over the left scapula. The respiratory murmur, which was feeble on both sides, was weaker at the left than at the right summit in front and behind. Vocal resonance and the bronchial whisper showed only the normal points of disparity on the two sides, and so, also, the heart-sounds. There were no rales. This patient, in a letter dated in June, 1859, stated that shortly after seeing me he had a slight hemorrhage, but none since that attack. I had no further account of the case until June, 1868, when a brother of the patient, who consulted me with well-marked phthisis, informed me that he was then in robust health.

In Case No. 4 of the series just cited, it is probable that with each occurrence of transient cough accompanied by hemorrhage there was a commencing affection, which, as it were, aborted. Is it not a reasonable conjecture that the hemorrhage was a means of the abortion? Is not this conjecture reasonable in the case last cited? May not this question be extended so as to embrace most of the cases in which hæmoptysis occurs without being immediately followed by phthisis? I have already stated that phthisis is sometimes preceded by hæmoptysis when, directly after the hemorrhage, not only are the symptoms wanting, but there are no signs of disease to be discovered by those skilled and experienced in physical diagnosis. I will cite a case in illustration of this.

Mr. M., aged about 25, consulted me in March, 1868. A year and a half prior to this date he had a slight bronchial hemorrhage in Paris. He was examined by Bouillard, with a negative result. He had a written statement from Bouillard to that effect. In the summer of 1867, at Newport, Rhode Island, he had a rather profuse hemorrhage, and again another, also profuse, in Washington, in the autumn of 1867. He was examined by Dr. May, of Washington, with a negative result. In March, 1868, I made two careful examinations of the chest, and a third examination in the July following, without discovering any signs of pulmonary disease. He had a systolic murmur at the base of the heart, and also at the apex, but without enlargement. His general health was excellent, and it continued to be so until in the spring of 1869, when cough and want of breath on exercise followed confinement from an injury of the chest, caused by a fall from his horse. In August I found extensive solidification of the left lung. He progressively failed, took ship for his native country, Peru, South America, and died a few days after reaching home.

A comparison of the symptoms and signs before and after hæmoptysis, in a certain proportion of cases, thus, does not show this event to be unfavorable, if, indeed, it be not sometimes useful. In other cases, however, there is the evidence of a notable increase of the pulmonary affection directly after the occurrence of hæmoptysis. In illustration of this fact I shall cite a number of cases.

Case 1. Miss K., aged 18, was visited by me, in consultation with the late Prof. Rogers, of Louisville, October 9th, 1854. She had had slight bronchial hemorrhage a year previously, the hæmoptysis having been neither preceded nor followed by cough or any other pulmonary symptom. Three weeks before my visit she had another attack of hæmoptysis. At the time of my visit she was suffering much from dyspnœa; the respirations were from 40 to 50 per minute; the pulse was 130, the skin moist, and the aspect pallid. There was notable dulness on percussion at the summit of the chest on the left side, with an abundance of fine bubbling rales. Death took place on the following day. Prior to the occurrence of the hæmoptysis, three weeks before the death of the patient, there were no pulmonary symptoms which were considered of importance enough to claim medical advice.

There was no post-mortem examination in this case, but the history shows that either phthisical exudation or an intercurrent pneumonia followed the second attack of hæmoptysis.

Case 2. Mr. G., aged 25, came under my observation in December, 1854. A cough, nearly dry, had existed for about a year. During the summer of 1854 he had a slight bronchial hemorrhage. While under my observation he did not consider himself an invalid; he was engaged in the study of medicine, and was also occupied as a literary writer. An examination of the chest showed considerable contraction of the right side, evidently from a chronic pleurisy which had occurred six years before. Positive signs of phthisis were not made out. In July, 1854, he wrote to me that he had at that time hæmoptysis. He died in the following August. After his death I learned from his father that the hæmoptysis occurred when he was apparently in his usual health. The hemorrhage was very profuse, and was repeated daily for ten consecutive days.

In this case the profuse hæmoptysis was accompanied or followed by some morbid condition which destroyed life within a few weeks, inasmuch as death was not attributable to the loss of blood.

Case 3. Mr. L., farmer, aged 50, March 13th, 1857, consulted a physician for a "cold" which he had had for a few days. Sixteen years previously he had an attack of hæmoptysis, and subsequently a second attack. Prior to the present illness he had no cough, and had been of late unusually well. His habits were active, and after a day of much exertion and exposure, in the evening he had hæmoptysis. This was on the day following that of his seeking advice for a "cold." The hemorrhage was profuse, and it recurred daily for several days. The quantity of blood lost by the bronchial hemorrhage was large, and, in addition, venesection was employed twice. I saw him in consultation on March 19th. At this time positive signs of phthisis were not made out by means of physical signs. After the 20th of March he had no recurrence of the hemorrhage. The cough from this date increased, and he soon began to expectorate. On the 14th of the May following I visited him again. He now had a large muco-purulent expectoration. He had lost from twenty to thirty pounds in weight. On examination of the chest, marked dulness on percussion was found over the left scapula, with feeble respiratory murmur, bronchophony, and bronchophonic whisper. Death took place early in the following June.

In this case solidification followed the profuse hæmoptysis, which recurred for several days in succession, and from its rapid course the disease might be called "galloping consumption."

Case 4. Miss C., aged 32, had had slight hæmoptysis six years before coming under my observation in May, 1857. Meanwhile she had never been entirely free from cough and a small expectoration. She considered herself, however, well, and was on a visit at the house of a friend, when, on Sunday evening, after having been at church, she was attacked with hæmoptysis. The hemorrhage was at first slight, but it recurred during the night, and became profuse, the loss of blood being estimated to be two pints. I visited her in consultation ten days after this occurrence. The respirations were then 30 per minute; the prolabia were livid; the pulse was 130, and she was greatly prostrated. Death took place the following day. Post-mortem examination showed both lungs crammed with semi-transparent granulations, and no exudation.

In this case the bronchial hemorrhage evidently signalized the commencement of acute tuberculosis.

Case 5. Capt. F., æt. 42, had had hæmoptysis nine years before he came under my observation; meanwhile, excepting a malarial fever, contracted in Panama, having had vigorous health. In January, 1857, he consulted me for a cough which he attributed to "taking cold." I made no record of examinations of the chest at this time nor subsequently. The cough continued, but after the following May it became less, and he improved as regards his aspect and weight. On the last day in July he hardly considered himself an invalid, when, after a hearty dinner, he was attacked with hæmoptysis. The hæmoptysis recurred August 1st, and once or twice daily on the succeeding eight days. There was no recurrence afterward. From this time until shortly before his death, which took place on September 16th, he suffered much from dyspnœa. There was lividity of lips; but the mode of dying was by asthenia.

In the absence of a post-mortem examination, and of any record of physical signs, I can only say that the bronchial hemorrhage ushered in some grave pulmonary condition which destroyed life in about six weeks.

Case 6. In December, 1866, I visited with Dr. C. D. Smith, Mr. C., aged about thirty years. He then had daily recurring profuse bronchial hemorrhage. A cursory examination of the chest gave no positive signs of disease. The hemorrhage continued to recur almost daily for two or three weeks, and at times it was profuse. Four weeks after my first visit I again visited him. He had then a slight hacking, dry cough; he was pallid and weak, and the appetite was poor. Subcrepitant rales existed over the whole of the lower lobe of the right lung. Death took place about six weeks afterward.

There was no *post-mortem* examination in this case. I saw the patient but twice, and under circumstances in which a thorough physical exploration was not practicable. It is evident, however, that, either with or following the profuse and persistent hemorrhage, there was some grave morbid condition developed.

Case 7. This case is not in my collection. I saw the patient, with Dr. C. W. Packard, of New York, and omitted to make a note of the case. Dr. Packard has kindly furnished me with the history from which are taken the following details: Mr. L., aged twenty-three, resided in the country near New York. Prior to his last illness he had been subject to cough for a year. The cough was dry, and he was at times entirely exempt from it. This cough followed a slight hæmoptysis. His general health during this year, up to his fatal illness, was good, and he was actively engaged in business. On the 16th of November, 1870, he raised a little blood. On the next day, while on his way to the city in the cars, he had a chill, and on reaching the city went to the house of a friend. Shortly after reaching the house he had profuse hæmoptysis. He was seen by Dr. Packard soon after the occurrence of the hemorrhage. On the following day there was febrile movement, as denoted by the pulse and the axillary temperature. On this day there was slight dulness on percussion over the left scapula, with feeble respiratory murmur and bubbling rales. Subsequently the area of dulness increased, extending over a considerable portion of the anterior portion of the left side of the chest. The hæmoptysis recurred daily up to his death, and was sometimes profuse. The axillary temperature was maintained without remissions. I saw the patient the day before his death. He was then very feeble; the pulse was frequent and the face was cyanotic. There were no signs of cardiac disease. The duration of the illness was nine days.

The foregoing series of cases establishes this conclusion—namely, in a certain proportion of cases bronchial hemorrhage is neither conservative nor without any marked import, good or bad, but it denotes the development of a morbid condition which speedily destroys life. Such cases form a small minority of those in which hæmoptysis occurs. The majority is so large of the cases in which clinical observation shows hæmoptysis to be of not unfavorable import, that we are warranted in stating the latter to be the rule, the cases in which the event is notably unfavorable being the exceptions. The exceptions do not of course invalidate the rule; and while the physician is warranted thereby in giving the encouraging assurance that an attack of hæmoptysis will in all probability not prove unfavorable, the occurrence of cases such as have just been cited is to be borne in mind.

What is the pathological explanation of these cases? The hemorrhage *per se* does not destroy life; death is not caused by the loss of blood. There is one way in which it has been supposed the hemorrhage may be indirectly the cause of death. This is the coagulation of blood extensively in the bronchial tubes. According to Niemeyer, in this way bronchial hemorrhage is sometimes a cause of phthisis. An example is cited in Niemeyer's work[1] of old clots found in the bronchial tubes after death, the appearance being not unlike that of venous thrombi. That the blood may coagulate extensively in the bronchial tubes is certain. I have seen two well-marked specimens, an account of one of which I shall presently introduce. It is, however, extremely rare. Coagulation sufficient to occasion obstruction of the bronchial tubes to any considerable extent is by no means frequent. This is a matter easily determined by physical exploration. I have occasionally found, in connection with hæmoptysis, suppression of the respiratory murmur over a portion of a lung, but such instances are exceptional even when the hemorrhage is persistent and profuse. When clots are formed and retained, not only is it purely conjectural that they lead to phthisis, but such a supposition has no rational support. Foreign bodies are retained indefinitely in the air-tubes without giving rise to phthisis, and the latter is not a sequence of the presence of lymph in cases of the so-called plastic bronchitis. The morbid effects of the presence of coagulated blood within the bronchial tubes relate only to mechanical obstruction and bronchial inflammation. It is not then probable that in any of the foregoing cases the grave symptoms which followed the hæmoptysis, and the death were attributable to the retention of blood within the bronchial tubes. In fact, there is no ground for supposing that these grave symptoms and the death were in any way dependent on the hemorrhage. The hæmoptysis was incidental to the development of certain local morbid conditions which destroyed life. Of these conditions the hemorrhage was either a primary symptom or a coincident event. This is the view most consistent with the clinical facts in these cases, and, at the same time, in harmony with the facts deduced from the clinical study of the cases in which hæmoptysis has no unfavorable import. The pathological explanation, therefore, involves knowledge of the local conditions with which the hemorrhage is associated. It is unfortunate that in all the cases, save one case, there was no examination after death. In the single case (No. 4) in which the body was examined, the morbid appearances showed acute tuberculosis. This, then, is one morbid condition which may exist in such cases. Another morbid condition is rapidly induced solidification. Cases No. 1 and No. 3 and No. 7 are exemplifications of this, as determined by the evidence of physical signs. Considering the great infrequency of acute tuberculosis, the second of these two conditions is probably that which generally exists in cases like those under present consideration. In such cases the hemorrhage is incident to either a primary or a renewed affection, as it is in most of the cases in which hæmoptysis occurs; but whereas, in general, after hæmoptysis the pulmonary affection does not rapidly progress, and sometimes aborts, exceptionally it progresses rapidly, and ends fatally within a short period. That the hemorrhage does not conduce to this result is further shown by the fact that cases of so-called "galloping consumption" are by no means always accompanied by hæmoptysis. My collection of cases furnishes instances of an equally rapid fatal career of phthisis unattended by hemorrhage. These cases will be referred to in another connection.

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[1] Text-Book of Practical Medicine.

Aside from the few cases of phthisis in which the development of grave morbid conditions immediately follows the hemorrhage, a comparison of the symptoms directly before and after hæmoptysis, sometimes furnishes evidence of an increase of the pulmonary disease. The cough and expectoration are increased; the respirations are more frequent; the pulse is more accelerated, and the temperature of the body rises. My histories contain illustrations of this fact. As regards the pathological import of the hemorrhage, the views first presented are, of course, measurably applicable to these cases.

I have stated that two well-marked specimens of clots formed in the bronchial tubes have fallen under my observation. In one of these there was extensive obstruction of the tubes, and death took place, but I did not see the patient, and I am unable to state any details of the history. The other case has occurred since the greater part of this chapter was written, and the facts are as follows: Dr. P., a practitioner of medicine in Canàda, consulted me in June, 1873. He had had two attacks of hæmoptysis, the last of recent occurrence. He had slight cough, but his aspect was healthy. On an examination of the chest I found dulness at the right summit, with relatively feeble respiration and an abnormal transmission of the heart-sounds. The diagnosis was a slight phthisical affection. Shortly afterward he had another small hemorrhage. There was no recurrence until the following October, when he raised daily for six successive days a few ounces of blood. Up to this time his general health had improved, and he had gained ten pounds in weight. About a month afterward he had a copious hemorrhage which continued at intervals for ten days. On the third day he began to expectorate bronchial casts. He continued to expectorate these for twenty-four hours, together with fluid blood in abundance, the latter amounting to sixty ounces in the twenty-four hours. These casts represented tubes of the size of the second or third subdivisions with branches of extremely small size. He sent me a specimen which I exhibited at a meeting of the New York Pathological Society, November 26, 1873.[1] The casts presented the appearance of fibrin, and on microscopical examination, made by Prof. Janeway, showed fibrillary fibrin, with deformed and shrunken red blood globules, a small quantity of hæmatoidin and a few white blood globules. Prior to the expectoration the patient experienced dyspnœa; but afterward this disappeared, and after recovering from the weakness caused by the loss of blood, his condition, according to his statement by letter, was as good as before this event occurred.

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[1] *Vide* New York Medical Record, Jan. 15, 1874.

This patient consulted me again in June, 1874. He was then en route for a voyage to Europe. The physical signs showed cavity at the summit of the chest on the right side. His general health was fair, and he had continued to practise up to the time of his leaving home.

It remains to consider the inquiry, What apparent influence has bronchial hemorrhage upon, on the one hand, the fatality, and on the other hand, the arrest of and recovery from phthisis, also on the tolerance of the disease, and on its duration in fatal cases? This inquiry is to be considered by comparing the cases in which hæmoptysis did not occur, with those in which it did occur, as regards fatality, arrest, recovery, tolerance, and duration. In ninety-eight of the cases, the histories of which are sufficiently complete for this comparison, the occurrence of hæmoptysis is noted, and in eighty-one cases the absence of hæmoptysis is either noted, or the histories are sufficiently full and complete to render the latter quite certain, although the fact is not stated. The whole number of cases, therefore, to be studied with reference to the points just named is one hundred and seventy-nine. In each of the two groups the great majority of cases were fatal. In a small minority recovery took place. Recovery is considered as having taken place when all symptoms of pulmonary disease disappeared and the usual health of the patient was restored. But in one of the cases thus ending in recovery, there was subsequently recurrence of the disease, which proved fatal.

An arrest of the disease is considered as denoted by an improvement, approximating to recovery, continuing for a considerable period, the termination in some cases not known, and in some cases the histories showing a recurrence proving fatal. Tolerance of the disease is shown by the continuance of life with fair general health for a long period, that is, from five to forty years, notwithstanding the existence of a greater or less amount of the pulmonary affection. This classification of cases will be considered more fully in the next chapter in connection with prognosis, and it will be adopted in the study of cases in reference to treatment. Suffice it to add here, that the principles of the classification have been applied equally to the two groups, that is, to the cases with, and the cases without, the occurrence of hæmoptysis, in making the comparison with respect to fatality, recovery, arrest, and tolerance. This comparison gives the following results:—

In the group of 98 cases in which hæmoptysis was more or less prominent, there are 19 recoveries, in 23 cases there was an arrest of the disease, and there was notable tolerance (5 to 31 years) in 16 cases. Excluding these 58 cases, 40 remain in which death took place within a period of five years.

In the group of 81 cases in which hæmoptysis did not occur, there are 12 recoveries; in 8 cases there was an arrest of the disease, and there was notable tolerance (5 to 40 years) in 3 cases. Excluding these 23 cases, 58 remain in which death took place within a period of five years.

It thus appears, that cases in which hæmoptysis occurs show a larger number of recoveries, and a notably greater proportion of instances of arrest and tolerance, than cases in which hæmoptysis does not occur. Under this aspect, therefore, bronchial hemorrhage is to be regarded as a favorable event. Pushing the investigation further, the cases in which hæmoptysis occurred may be analyzed with reference to the apparent influence of the amount of bronchial hemorrhage as denoted by its profuseness and the repetitions of the attacks.

Taking the 98 cases in which hæmoptysis was more or less prominent, I shall proceed to compare the 19 cases in which recovery took place, the 23 cases in which there was an arrest of the disease, the 16 cases in which the disease was for a long period tolerated, with the remaining 40 cases, the comparison having reference to the amount of bronchial hemorrhage.

Of the 19 cases in which recovery took place, the attacks of hæmoptysis were repeated and hemorrhage was profuse in 9. Of the remaining 10 cases, in one case the hæmoptysis recurred for three successive nights, but nothing is noted respecting the amount of hemorrhage; in one case simply the recurrence of hæmoptysis is noted; in two cases it is noted that there were two attacks, but nothing is noted respecting the amount; in one case there were repeated attacks, but the amount was slight, and in another case there were also three attacks, and it is noted that the hemorrhage was not profuse; in one case there were repeated attacks, but the amount is not noted; in one case there were four attacks, the quantity moderate; in one case there were two attacks, the quantity slight, and in one case the hemorrhage occurred but once and was slight.

Of the 23 cases in which there was an arrest of the disease, in 15 there were repeated attacks of hæmoptysis and the hemorrhage was more or less profuse; in 2 cases there were repeated attacks, with moderate hemorrhage; in 3 cases there were repeated attacks with slight hemorrhage; in one case there were repeated attacks with considerable hemorrhage, and in 2 cases there were repeated attacks, nothing being noted respecting the amount of hemorrhage.

Of the 16 cases in which the disease was tolerated from 5 to 31 years, in 9 there were repeated attacks of hæmoptysis, and the hemorrhage was profuse; in 2 cases the attacks were repeated, but nothing is noted respecting the amount of hemorrhage; in one case the attacks were repeated and the amount slight; in one case there were ten or twelve attacks, the amount generally slight; in one case it is noted the attacks were numerous and the quantity slight; in one case there was but one attack and the hemorrhage was slight, and in one the fact only that hæmoptysis occurred is noted.

Aggregating the cases in the three foregoing classes the whole number is 58. Deducting from this number ten cases of which the histories are deficient in information respecting the amount of hemorrhage, the remaining number is 48. Of these 48 cases, the number in which the hemorrhage was either profuse or considerable is 35, and the number in which it was either moderate or slight is 13.

These results are now to be brought into comparison with the results of an analysis of the cases exclusive of the above, that is, the cases ending fatally within five years. The number of these cases is 40. From this number are to be deducted 11 cases of which the histories are deficient in information respecting the amount of hemorrhage. The number of cases remaining is 29. Of these 29 cases, in 17 the attacks of hæmoptysis were repeated and the hemorrhage was profuse; in 6 cases the hemorrhage was profuse, but it is not noted that the attacks of hæmoptysis were repeated, and in 6 cases the hemorrhage was slight.

The comparison of these two groups of cases, as will be perceived, does not show a striking contrast as regards the proportion of cases in which the amount of hemorrhage was, on the one hand, either considerable or profuse, and, on the other hand, either moderate or slight. The apparent influence of hæmoptysis, therefore, on recovery, arrest and tolerance, is not dependent on the amount of hemorrhage.

There is still a point of inquiry remaining, in reference to which, the cases in which hæmoptysis occurred, and the cases in which it did not occur, are to be analyzed and compared, namely, the apparent influence of bronchial hemorrhage on the duration of phthisis, exclusive of the cases of recovery, arrest, and notable tolerance. The cases to be analyzed with reference to this point of inquiry, are the cases which ended fatally within five years. Taking from the cases, with and without hæmoptysis, those of which the duration is determinable from the history, it follows that the number of cases is precisely the same, namely, 51. An analyis of the two groups gives the following results:—

Of the 51 cases *without* hæmoptysis, the duration was over 48 months in 3; between 36 and 48 months in 2; between 24 and 36 months in 5; between 12 and 24 months in 17, and under 12 months in 24.

Of the 51 cases *with* hæmoptysis, the duration was over 48 months in 2; between 36 and 48 months in 4; between 24 and 36 months in 5; between 12 and 24 months in 15, and under 12 months in 25.

It is thus evident, that, so far as the results of the analysis of these cases warrant an inferential conclusion, hæmoptysis has no marked apparent influence on the duration of phthisis in the cases which prove fatal within a period of five years. It is to be noted, that, while it has not an apparent favorable influence, as judged by the duration, it is not of unfavorable import in this point of view.

In conclusion, some remarks on the treatment in attacks of hæmoptysis can be better made here than in connection with the treatment of phthisis in another chapter.

The mental disturbance which an attack of hæmoptysis is apt to occasion, especially a primary attack, renders it desirable for the physician to make such encouraging statements as are warranted by clinical facts. Assuming either that phthisis is not established, or that it is not advanced, we are authorized in the first place to assure the patient, even when the hæmoptysis is profuse and repeated for many successive days, that immediate danger from the hemorrhage is almost *nil*. The very great infrequency of the cases in which death is caused by the loss of blood is to be borne in mind. In the second place, we may say, if there be evidence sufficient to show the existence of pulmonary disease, that with the occurrence of hæmoptysis the chances of recovery, arrest, or tolerance are greater than if hemorrhage did not occur. Here, too, a fact is to be borne in mind, namely, in rare instances an attack of hæmoptysis is accompanied and followed by symptoms of great severity, and death takes place within a short period. Exclusive of these cases, the symptoms following hæmoptysis sometimes show either the development or an increase of the disease, and sometimes, if the disease already exist, the symptoms denote improvement. The statement that relief may follow a hemorrhage will sometimes tend greatly to diminish undue apprehension.

The significance of hæmoptysis as denoting phthisis being generally known, a person who has an attack when apparently in perfect health, is at once led to infer the doom of consumption; but after the hemorrhage has ceased, if no symptoms of pulmonary disease ensue, this apprehension may disappear, and the occurrence of the hæmoptysis may be either forgotten or regarded as an accident of no importance. Under such circumstances the physician should consider that, as a rule, sooner or later, phthisis becomes developed, and the importance of giving proper heed to the attack of hæmoptysis is to be impressed. It is wise always to act as if phthisis were threatened, adopting such hygienic measures as may be likely to ward off danger in that direction.

In an attack of hæmoptysis the patient is usually intensely anxious to have the hemorrhage arrested. To arrest the hemorrhage is a therapeutical object in view of the results of the foregoing clinical studies, for these studies have developed no facts leading to the conclusion that the continuance or the profuseness of the hemorrhage is ever desirable. So common and wide spread is a confidence in the use of common salt, that the physician generally finds it has been used more or less freely before he has seen the patient. The usual mode of using it is to take the fine salt in substance into the mouth. If the hæmoptysis have ceased under its use, of course it has the credit of having arrested the hemorrhage, and such instances are numerous enough to give support to the popular confidence in this remedy. Patients, in general, voluntarily abstain as far as possible from any physical exertions; and repose is to be enjoined, although the instances in which persons who become accustomed to attacks and do not pay much attention to them, are sufficiently numerous to show that the hemorrhage is not always kept up or renewed by physical exertions. The common idea is, that an attack generally depends on some exciting cause (an idea which the study of cases does not sustain), and, hence, the importance of avoiding all exertions is exaggerated. This idea leads not infrequently to too prolonged quietude and the observance of other needless precautions against renewed attacks after the hemorrhage has ceased. It is customary, and with reason, to direct bland articles of diet, which are to be taken cold. Milk should be the basis of the diet during the continuance of the hæmoptysis. If persons are not affected unpleasantly by opiates, these are useful by allaying nervous excitement. In general they should enter more or less into the treatment during an attack of hæmoptysis.

The more active measures for the arrest of the hemorrhage are those, 1st, which have reference to the general and the pulmonary circulation; 2d, the introduction into the blood of remedies supposed to have a hæmostatic operation; and 3d, topical styptic applications.

1. Venesection was formerly employed, and sometimes largely, for the arrest of bronchial hemorrhage. Several of the cases in my collection were recorded so long ago that the employment of this measure enters into the histories. It was also customary to employ local bloodletting by means of cups and leeches. It would require not a little hardihood to advocate bleeding for this end at the present time. I have no disposition to do this. But it may be remarked, that the injudiciousness of abstracting blood for this purpose is perfectly consistent with its efficaciousness in certain cases. The obvious explanation of this statement is, that the evils of bloodletting may outweigh the advantage gained by accomplishing the object. With the views respecting bloodletting which now prevail, it is not necessary to discuss

this measure. This is the more unnecessary because it is probable that whatever efficaciousness bloodletting may have, may be obtained without the abstraction of blood. Ligation of the limbs so as to detain blood in the veins beyond the ligatures, secures the effect of venesection. I have witnessed an immediate arrest of hemorrhage by resorting to this measure. The patient, whom I saw with Dr. Varick, of Jersey City, had profuse hæmoptysis recurring after short intervals for several successive days. Loose ligatures were applied to the four extremities and these were tightened whenever the hemorrhage returned. A hemorrhage occurred during my visit, and it ceased almost instantly on tightening the ligatures. Detaining thus the blood in the four extremities should only be done by the physician. The effect on the circulation is very great, and, without watching, fatal syncope might be induced. Of course, the ligation is to be continued for a short time only, the effect on the pulse being constantly watched. The effect of the local abstraction of blood by cups or leeehes, may be obtained by dry cupping, and to a certain extent, by large sinapisms. These substitutes for bloodletting, more especially the ligation of the limbs, are admissible only when the pulse has a certain degree of fulness and strength; they are contraindicated if the pulse be small and weak. There is a marked difference in different cases with respect to the activity of the circulation, or, to speak more definitely, of the heart, as represented by the characters of the pulse. In attacks of hæmoptysis with a full, strong pulse, the direct cardiac sedatives may be employed with advantage, namely, aconite, digitalis and the veratrum viride; also, the indirect sedatives, namely, saline purgatives and nauseants. The employment of these remedies is to be regulated by the circumstances proper to individual cases, such as the amount of hemorrhage, the tendency to its renewal, the strength of the patient, etc. In the category of measures having reference to the circulation, belongs the application of cold to the chest. This may be resorted to especially if the hemorrhage persist despite the employment of other measures. The most convenient and effective mode of applying cold is by means of compresses wet in iced water, which are to be renewed every few minutes, or, as soon as they acquire warmth from the body. The applications may be continued for several hours if they do not cause discomfort. They will diminish the heat of the body if this be morbidly increased. It is hardly necessary to add that none of the potential measures are indicated when the hemorrhage is slight or moderate.

The more prominent of the hæmostatic remedies are the tannic or gallic acid, the acetate of lead, the pernitrate or persulphate of iron, and ergot. After a pretty large experience in the use of these remedies, I find it difficult to form any positive opinion as to their value severally and relatively. They often seem to have no effect as hæmostatics, and when the hemorrhage ceases under their use, there is always room for the supposition that the cessation is due to an intrinsic tendency thereto, rather than to the remedies. I am far, however, from being disposed to deny that they exert more or less influence in the arrest of bronchial hemorrhage. It may seem that I dismiss the consideration of these remedies with undue brevity, but I am unable to add any further remarks which would have importance in my own estimation.

As regards the topical application of styptics to the bronchial mucous membrane, I shall dismiss the consideration of them with a few words. The application is, of course, to be made by means of atomized liquids. The inhalation of spray from liquids holding in solution alum, gallic acid, and astringent preparations of iron has been employed with success for the arrest of bronchial hemorrhage. My practical acquaintance with this mode of treatment is too limited for me to speak of its merits. I have seen apparent success from the inhalation of the vapor of turpentine in arresting a persisting slight hemorrhage. I have also known the inhalation of atomized liquid persulphate of iron promptly efficacious in profuse hæmoptysis.

After bronchial hemorrhage has ceased, it is not judicious to continue the use of remedies with a view to forestall the possible recurrence of hæmoptysis; nor is the continuance of rigid rest and a low diet advisable. The danger which an attack of hæmoptysis opens up, when it occurs in one apparently well, is the development of phthisis; and this danger points to the importance of active habits of life, together with full alimentation, and, perhaps, the use of alcoholic stimulants within certain limits. The more the system is invigorated by a hygienic course adapted to this end, and the more thereby the danger of phthisis is lessened, the less the liability to recurring attacks of hæmoptysis. If, as is true in most instances, hæmoptysis have either occurred in connection with already existing tuberculosis, or, the evidence of the latter immediately follow, the danger from an increase of the tuberculous affection is vastly greater than that incident to the liability to renewals of the hemorrhage. Under this view it would be highly injudicious to employ any measures of treatment with reference to such a liability, if the measures conflicted with those indicated by the tuberculous affection. Moreover, it is to be borne in mind in this connection that the chances of recovery, arrest, and notable tolerance, in cases of tuberculous disease, as our clinical studies have shown, are greater when hæmoptysis occurs than when this event is wanting.

Diarrhœa.

Excluding cases in which diarrhœa occurred shortly before death, the number in which this symptom was noted as more or less prominent is thirty-one. This number does not, it is to be considered, represent the ratio of instances in which the symptom may have existed in the whole collection of cases analyzed, for, doubtless, it occurred in some cases, of which the previous histories are incomplete, and probably in not a few of the cases of which the subsequent history was not ascertained. As regards its frequency in cases of phthisis, it may be said, in general terms, that it is of neither very frequent nor very infrequent occurrence. The points of inquiry to which the study of the 31 cases in which the symptom enters into the histories will be directed, are, its significance with respect to intestinal lesions, its relations to other complications and to the pulmonary affection, its bearing on the prognosis, and its apparent effect on the duration of the disease.

Of the 31 cases, in 10 the histories embrace examinations after death. In all of these 10 cases, save one case, intestinal ulceration existed. In one case there was only a single patch of ulceration situated just above the cæcum. In the other cases there were ulcers more or less numerous, and varying in size. Generally the ulcers were situated in the ileum, and when confined to a portion of this intestine, they were in the lower part. In the case in which the ulceration was most extensive, ulcers were found everywhere throughout the small intestine which in some situations was encircled by bands of ulceration from one to two inches in width. Perforation took place in this case. In another case the ulcers were few in number and of small size. In two cases there were ulcers in the large, as well as in the small, intestine, and in one of these cases the ulcers in the large intestine were more numerous and larger than in the small intestine. In the single case in which ulceration was not found after death, the appearances in the small intestine were described as follows: "At the lower part of the ileum in spaces occupied by the Peyerian and solitary glands, numerous round bodies of the size of small peas projected into the canal. Some of these contained a liquid like softened tubercle; others were white and cheesy. There was no thickening nor any appearance of inflammation around these bodies. They were most abundant near the cæcum. The mesenteric glands were enlarged, some of the size of a small bean, and were of a cheesy consistence." In one case in which there were numerous small ulcers in the ileum, there was a solitary small round ulcer in the stomach. In this case there were no symptoms noted which pointed to the existence of gastric ulcer.

In most of the ten cases the diarrhœa was a prominent symptom, and persisted up to the time of death. There were two exceptions to this rule. In one of these exceptional cases the diarrhœa ceased some weeks (the number not noted) before death. In the other case it was noted that the diarrhœa was readily controlled, and continued for only a short time. The diarrhœa was prominent and persistent in the case in which there was only a single patch of ulceration in the ileum. It is certain that the amount of ulceration cannot be accurately estimated by the prominence of the diarrhœa.

The mesenteric glands were, without an exception, more or less enlarged. In several cases it was noted that the enlargement was great or considerable, and in one case some of the glands were as large as hickory-nuts. It was generally noted that the glands contained material of a cheesy consistence. That the affection of these glands is not always dependent on a prior intestinal affection, is a fair inference from the fact that the latter does not invariably coexist. In one of my cases the mesenteric glands were enlarged without any affection of the mucous membrane. (*Vide* Chapter I., page 44.) The most rational view is, that the affection of the intestinal and that of the mesenteric glands have a common causation.

Perforation of the intestine occurred in two of the ten cases in which the intestines were examined after death. In one of these cases the immediate cause of death was peritonitis thus induced. In the other case peritonitis existed, but the immediate cause of death was intestinal hemorrhage. Perforation of intestine was found in one of my cases in which the antemortem history was not noted. Its occurrence was inferred from the history in a case in which there was no post-mortem examination. In this case diarrhœa had existed for one day only, the symptoms of perforation and peritonitis following a straining effort at stool, and death taking place three days afterward.

Does recovery ever take place in cases of phthisis when the prominence and persistence of diarrhœa warrant the conclusion that intestinal ulceration exists? The study of my cases furnishes no facts on which an affirmative answer to this question can be based. Of the 31 cases, in one case the diarrhœa, which had existed for four months, ceased when the patient, a seaman, was in hospital, and he was discharged, feeling able to return to his occupation, the signs showing distinctly tuberculous disease at the summit of the left lung. The subsequent history was not ascertained. In another case in which there was evidence of chronic peritonitis, the patient passed from under my observation, and the history is incomplete. The remaining 29 cases ended fatally. In the case of the seaman, just referred to, assuming that the diarrhœa of four months' standing denoted intestinal ulcers, the cessation of the diarrhœa is not proof that the ulcers had healed, for in one of the cases in which ulcers were found on post-mortem examination, diarrhœa had ceased some weeks before death, and in another case it is noted that the diarrhœa was readily controlled, and continued for only a short time. There is, therefore, no ground to conclude, from the analysis of these 31 cases, that intestinal ulcers in cases of phthisis ever heal; on the other hand, so far as the facts developed by this analysis bear on prognosis, they go to show that recovery is not to be expected when intestinal ulceration is to be inferred from the diarrhœa. The only approach toward a solid ground for encouragement in the prognosis, is the single case in which, after the cessation of diarrhœa, there was sufficient improvement for the patient to undertake the duties of a seaman.

It is, however, to be added, that in several cases there was a temporary suspension of the diarrhœa. In one case in which diarrhœa was prominent early in the disease, it ceased, and the patient seemed to have recovered from the pulmonary disease. After some weeks, however, the pulmonary symptoms returned, together with the diarrhœa, and the latter continued until death. In another case, after continuing during a whole winter, the diarrhœa ceased, and the record is defective as regards a return and persistence until death. In another case, the diarrhœa, which had existed for six months, ceased for a time, but subsequently returned and continued until death. In a case in which there was no post-mortem examination the diarrhœa ceased for some time before death.

What influence has persistent diarrhœa on the duration of phthisis? Of the 29 cases known to have ended fatally the duration was determinable in 15. In these 15 cases the case in which death was ascertained to have been caused by perforation of the intestine, the case in which death was caused by intestinal hemorrhage, and the case in which perforation was inferred from the symptoms, are not included. The maximum duration in the 15 cases was 34 months. In this case diarrhœa was not a constant, but at times a prominent symptom. It continued during an entire winter. It is not noted whether it persisted during the latter part of the disease. The minimum duration was 3 months. This was an example of the so-called "galloping consumption." Of the 15 cases the duration was 6 months, or less, in 3 cases; between 6 and 9 months in 3 cases; between 9 and 12 months in 3 cases; between 12 and 15 months in 2 cases; between 15 and 18 months in 2 cases; 19 months in 1 case, and 34 months in 1 case. The average duration is a little under 13 months. So far as an inference is to be drawn from these cases, it is, that diarrhœa has a notable influence in shortening the duration of phthisis.

The agency of the affections of which diarrhœa is a symptom, namely, intestinal ulceration with enlargement and caseous degeneration of the mesenteric glands, in determining a fatal termination and in shortening the duration of phthisis, is shown by the small amount of pulmonary disease in some cases.

Four cases were strikingly illustrative of this point. One of these 4 cases was that in which there was the greatest amount of intestinal ulceration, perforation and consequent peritonitis being the immediate cause of death. In this case there were only a few scattered gray tubercles, and two or three small cavities in the lungs. The patient was a boy 14 years of age. In another case there was no post-mortem examination; but the physical signs and the pulmonary symptoms denoted a very small tuberculous affection of the lungs. In another case only a few small tubercles were found after death and a single small cavity. In the fourth case there was a small amount of solidification at the apex of the right lung and a cavity of the size of a hazelnut. In two other cases there were miliary tubercles in abundance but no cavities, and in three cases the pulmonary affection was moderate in amount, there being no cavity in one of these. In nine cases the lungs were much affected, as determined either by the appearances after death, or by physical signs and symptoms.

In two cases there was pleurisy with effusion at the time of death. These were the two cases just referred to in which miliary tubercles were abundant without cavity. In another case phthisis followed pleurisy; and in one case there were calcareous plates on the pleura of the size of the palm of the hand.

Peritonitis existed in three cases, in addition to the three cases in which perforation occurred; the existence of this complication was in one case determined by the appearance after death and in the other two cases by the symptoms only.

Chronic laryngitis existed in 4 of the 31 cases now under analysis. Of the 31 cases, hæmoptysis occurred in 7; it was noted as not occurring in 8, and its occurrence was not noted in 15. Perforation of lung and pneumo-hydrothorax did not occur in any case.

In one case the dejections contained liquid fat in considerable abundance, and in this case the pancreatic emulsion was given with benefit as regards not only the presence of fat but the diarrhœa.

Albuminuria was noted in two cases, and in one of these the presence of tube casts was also noted. In the latter case, diarrhœa preceded the cough for a month, and the kidneys were diseased, the variety of the disease not being noted. In the other case there was no post-mortem examination.

The conclusions drawn from the analysis of thirty-one cases with regard to diarrhœa are as follows:—

1. Diarrhœa, when prominent and persistent in phthisis, denotes, as a rule, ulceration in the small intestine, with enlargement of the mesenteric glands.

2. The prominence of this symptom is not always a criterion of the amount of ulceration.

3. Perforation of intestine is an occasional accident in connection with intestinal ulceration.

4. Cases of phthisis in which diarrhœa represents intestinal ulceration, offer very little, if any, ground for the hope of recovery; it is doubtful if cicatrization of the ulcers ever takes place.

5. Diarrhœa in some cases ceases for a time, notwithstanding the existence of ulceration.

6. The average duration of phthisis with diarrhœa is considerably shorter than the average duration of the disease in an indiscriminate collection of cases.

7. In some cases characterized by the prominence and persistence of diarrhœa, death takes place with a very small amount of pulmonary disease, and, under these circumstances, death may take place without the formation of cavity in the lungs.

8. Hemorrhage incident to intestinal ulceration may occur, and the loss of blood may be the immediate cause of death.

The last of the foregoing conclusions was illustrated by one case, a synopsis of the history of which is as follows:—

Eli C., aged 35, engineer, was admitted into Bellevue Hospital January 20, 1867. He stated that, excepting occasional attacks of rheumatism, he had always been well up to six weeks before his admission. Cough began at this time. He was then at work where fresh provisions were had with difficulty. Diarrhœa began ten days before his admission. He continued to work until five days before his admission. He then passed blood from the bowels in large quantity, and fainted from the hemorrhage while at stool. On his admission he was anæmic and feeble. There were several spots of ecchymosis on the surface of the body. On the second day after his admission he had another large hemorrhage, and fainted from the loss of blood.

Death took place on the following day. In the right lung at the apex there was a small amount of solidification and a cavity of the size of a hazelnut. The peritoneal cavity contained a large quantity of purulent liquid. In the colon and rectum were numerous large irregular shaped ulcers, in many of which the destruction had extended to the peritoneal coat. One point of perforation was discovered. A few small ulcers were found in the lower part of the small intestine. The mesenteric glands were much enlarged. The kidneys and liver were fatty. The surface of the liver had a bronzed color extending about a quarter of an inch into the substance of the organ. This was attributable to the action of intestinal gas either before or after death.

Miscellaneous Events Referable to the Digestive System.

Epidemic Cholera.—Mrs. D., aged about 35, in October, 1851, was confined. After confinement she had puerperal fever. She began to cough after recovering from the fever. In March, 1852, she had cough with considerable expectoration; she was pallid and emaciated; the pulse was 100, small and weak, and the respirations were 24. There was notable dulness on percussion at the summit of the right side of the chest, with broncho-vesicular respiration and bronchophony. During the summer epidemic cholera prevailed, and she was attacked with this disease. She had very large rice-water-like dejections, but she recovered under treatment with large doses of the sulphate of morphia. The phthisis proved fatal in the winter of 1853–54.

Sporadic Cholera.—Mr. C., aged 35, in August, 1864, presented the signs of phthisis at the base of the left lung, and obstruction of the right primary bronchus. Hæmoptysis, not preceded nor followed by cough, had occurred several years prior to this date. Cough had now existed for a few weeks. The cough with more or less expectoration, and the physical signs persisted without notable impairment of weight and strength up to July, 1857. During this period he had considered himself in fair health. At this date he had an attack of sporadic cholera, and after the occurrence of this affection he failed rapidly in strength and weight, becoming, in a short time, pallid and feeble. His appetite failed; he had looseness of the bowels, and the axillary temperature was 101½°. The signs showed solidification, and there was cracked metal resonance at the summit of the chest on the left side. He went to Minnesota, and shortly afterward died. Prior to the attack of cholera, he had been to New Orleans to escape the spring climate of the north, and returned apparently much improved. The attack of cholera was the point of departure for his speedy decline with an increase and rapid progress of the pulmonary affection.

Choleraic Dysentery.—Mr. W., aged 37, began to cough in August, 1851. After a few weeks the signs denoted a considerable affection at the summit of the chest on the right side. He passed the winter in Florida, and progressively improved, his weight becoming greater than at any previous period of his life. In April he lost weight and strength, and returned to his home in Buffalo, N. Y. He improved after his return, and appeared to be progressively regaining weight and strength, when, in August, 1852, epidemic cholera at that time prevailing, he was attacked with choleraic dysentery, and died five days after the date of the attack.

Gastric Ulcer.—In one of the cases in which intestinal ulceration was found after death, there was a small round ulcer in the stomach. In the history of this case no symptoms pointing to gastric ulcer were noted. In another case, in which there was no post-mortem examination, gastric ulcer was inferred from the symptoms. The following is a synopsis of the history: Agnes R., housekeeper, aged 30, was admitted into Bellevue Hospital October 2, 1866. During the previous six months, she had been in the habit of vomiting after taking food, at intervals varying from an hour to several hours. Of late the vomiting was of almost daily occurrence. She complained of a burning or gnawing pain in the epigastrium. She began to cough about the time that the vomiting began. There had been no vomiting of blood, and no hæmoptysis. She had not menstruated since the commencement of her illness. There was tenderness on pressure over the epigastrium, and no tumor was discoverable. There was dulness on percussion at the summit of the left side of the chest, with broncho-vesicular respiration. She failed progressively and died January 26, 1867. An autopsy was not practicable.

Peritonitis.—In chapter first, devoted to the morbid anatomy, it has been seen that appearances showing peritonitis were noted in only two cases, the peritonitis in each case being due to intestinal perforation. Reasons for not considering this small number of cases as representing the proportion of instances in which this complication of phthisis occurs are given in that chapter. (*Vide* page 45.) In one case in which a post-mortem examination was not made, the symptoms denoted peritonitis, and as these symptoms followed directly a straining effort at stool, perforation was inferred. In only two additional cases are symptoms denoting peritonitis noted. I subjoin a condensed account of these two cases.

Wm. C., aged 28, country merchant, consulted me December 23d, 1850. There had been some deterioration of health without definite ailments for two years. Several months before he saw me he had had necrosis of one of the metacarpal bones of the right hand, a purulent discharge still continuing. He had recently had measles. After recovery from this disease he was exposed to cold and wet at a fire, and from this time he kept the house. His chief ailment was pain in the abdomen. He lay upon the back with his limbs flexed. There was tympanites, and the abdomen was tender on pressure. He had a slight cough and expectoration, to which he attached no importance. There was slight abnormal dulness at the right summit of the chest, with some depression, deficient motion, increase of vocal resonance, and dry rales. The attending physician, Dr. McCollum, of Lockport, N. Y., has informed me that this patient died January 17th, 1851, death having been preceded by profuse expectoration, night sweats, and diarrhœa.

Mary Ann K., aged 40, domestic, admitted into Bellevue Hospital August 9th, 1861. Cough had existed for several years, but had increased during the last two years. Hæmoptysis had occurred for the first time in April, 1861. She was in hospital during that month with profuse hæmoptysis, and left at the end of the month. On her readmission she had diarrhœa, and enlargement of the abdomen. The legs were greatly œdematous. The urine was not albuminous. On the 12th of August I noted that peritonitis was considered as probable, from the tympanitic distension of the abdomen, the rigidity of the recti muscles, and the presence of some liquid effusion. On the 13th these symptoms were so marked that the diagnosis was quite positive. The pulse, however, was but little accelerated. Physical exploration gave unequivocal evidence of phthisis. There was some improvement prior to the first of the following month, when my term of service ended, and the subsequent history was not ascertained.

In accounting for peritonitis when it is not due to perforation of the intestine, a rational supposition is that it proceeds from tubercles in the peritoneal membrane. Tubercles, however, are not infrequently found in this situation unaccompanied by appearances showing peritonitis. (*Vide* Chapter I.) There is another rational explanation which may be applicable to some cases, especially to cases in which there is intestinal ulceration. This is the discharge into the peritoneal cavity of the liquefied morbid material contained in an enlarged mesenteric gland. This, which accounts for peritonitis in some cases of typhoid fever, may explain the condition in phthisis irrespective of tubercles in the peritoneal membrane.

Pharyngitis.

Chronic inflammation of the pharynx was noted in 24 cases, and this, as well as other complications, doubtless existed in a certain number of cases in the recorded histories of which it does not appear. It is noted that there was considerable pharyngitis in 3 cases, and that the inflammation was slight or moderate in 8 cases. The appearance is noted as granular in 4 cases. In 9 cases the history simply states that there was pharyngitis. Of these 24 cases, in 20 the patients were males, and in 4 females.

The pharyngitis was associated with laryngitis in 8, and existed without laryngitis in 16 cases. As will be seen presently, these 8 cases in which pharyngitis and laryngitis coexisted, form but a small proportion of the cases in which there was laryngitis, and yet the number is sufficient to show some pathological connection between the two affections; in other words, there is probably something more than mere coincidence in the association. But when it is considered that in a considerable majority of the cases of pharyngitis there is no laryngitis, and, in a large majority of the cases in which there is laryngitis, pharyngitis does not coexist, the association of the two in a certain proportion of cases furnishes little or no ground for supposing that there is any causative connection between these complications; that is, the pharyngitis does not give rise to the laryngitis, nor *vice versâ*, but whatever pathological connection exists relates to a common causation. Moreover, my cases furnish no ground for supposing that chronic pharyngitis implies either the existence of phthisis or a tendency thereto. Whether, in the cases in which pharyngitis was noted, this affection occurred prior or subsequent to the affection of the lungs, the histories do not enable me to state. Whatever may have been the facts in this regard, and admitting that pharyngitis existed in many cases when it was not noted, the vast number of instances in which this affection exists without being either accompanied or followed by phthisis, suffices to prove that the former has no causative relation to the latter.

Laryngitis.

Laryngitis is noted in 61 cases. Inasmuch as the evidence of this affection is obvious and unequivocal, I may assume that it would not be overlooked in any of the cases, but very likely it may have occurred in a greater or less number of cases after patients passed from under my observation. The number of cases in which it was noted shows it to be a frequent complication of phthisis. A striking contrast, as regards the frequency of this complication, relates to sex. Of the 61 cases, in 57 the patients were men, and in only 4 cases women. Now, in my collection of cases, the number of men is more than four times greater than the number of women; but, making allowance for this fact, a much larger number of men than of women were affected with laryngitis. There can thus be no question as to an influence pertaining to sex.

In the great majority of cases, the existence of laryngitis was determined by the symptoms alone, that is, without the demonstration afforded by either an examination of the larynx after death or an ocular inspection by means of the laryngoscope during life. In the cases in which such demonstrative proof was not obtained, the evidence chiefly relied upon was that derived from the voice. Persistent hoarseness or huskiness of the voice was considered as sufficient evidence of laryngitis, as well as aphonia whenever this had the distinctive characters of the loss of voice from changes within the larynx, namely, the patient speaking in a husky or stridulous whisper and with a manifest effort. These characters sufficiently distinguish the aphonia representing laryngitis from that due to paralysis of laryngeal muscles. Not only do these symptoms relating to phonation suffice for the diagnosis of laryngitis, but their absence is sufficient to exclude this affection.

In many cases the patients complained of more or less pain or uneasiness referable to the larynx. Generally the laryngeal affection did not embarrass deglutition; but there were exceptions to this rule. In several cases the act of swallowing excited cough with spasm of the glottis, and liquids were ejected through the nostrils. The interference with the ingestion of food was in some cases so great as to constitute a serious obstacle to alimentation, and death was manifestly hastened by inanition incident thereto.

The laryngitis in all the cases was chronic; and, with a single exception, the affection was from the first subacute. In the excepted case, the patient's previous history embraced symptoms which seemed to denote, not long after the occurrence of hoarseness, an attack of acute laryngitis. My cases furnish only this single example of acute inflammation supervening upon the chronic affection. My cases do not furnish an instance of œdema of the glottis, and in none is it noted that the chronic laryngitis occasioned any permanent obstruction to breathing. Patients often complained of annoyance and distress arising from the impairment and loss of voice, and not infrequently, the pulmonary symptoms seemed to them of relatively minor importance.

What chronological relations has chronic laryngitis to the pulmonary affection in cases of phthisis? This is a question of much importance, especially as regards the following point, namely, whether the laryngitis be always secondary to the tuberculous disease of the lungs. The facts bearing on this point are as follows: In 42 cases the laryngitis evidently occurred after the occurrence of the pulmonary affection, the existence of the latter being dated from a persistent cough, with other symptoms indicative of an affection of the lungs. In 5 cases, according to the recollection of the patients, the voice became affected coincidently with the commencement of the persistent cough. In 2 cases the patients stated that the affection of the voice was the first event in the previous history, preceding cough and other symptoms denoting any pulmonary affection. Taking these facts as they stand, it is certain that in the vast majority of cases chronic laryngitis, when it occurs in connection with phthisis, is secondary to the latter; and hence, if there be any relation of causation between the two, the laryngeal is dependent on the pulmonary affection. The point, however, is, whether the laryngitis be always consecutive. It is fair to consider the 5 cases in which, so far as determinable by the patients' statements, the two affections were coincident, as having no bearing on this point. If not really coincident, evidently, in view of the fact that in the vast majority of cases the laryngitis is secondary, it is to be presumed that this fact holds true of these 5 cases. It is, perhaps, probable that this presumption expresses the truth. Putting these 5 cases out of the question, there remain but 2 cases in which there is reason to suppose that the laryngitis preceded the pulmonary affection. A condensed account of these two cases is as follows:—

J. C., aged 46, had slight hæmoptysis with cough in October, 1864. Prior to this, his voice was husky, and the huskiness had continued up to the time when he came under my observation, April, 1866. At this time he was free from cough; his weight and strength were up to his standard of health; his appetite and digestion were good. At the right summit of the chest, in front, there was some depression with abnormal dulness on percussion; the respiratory murmur here was feeble, the vocal resonance and whisper were increased, and the heart-sounds were unduly transmitted. In view of these signs, with the history and symptoms, it was concluded that there had been a pulmonary affection at the apex of the right lung, and that arrest had taken place. The subsequent history of the case was not ascertained.

Mr. E., aged 36, began to be hoarse in December, 1869. He declared that no cough preceded the hoarseness. In a short time the hoarseness ended in aphonia. He spoke in a husky whisper when he consulted me in May, 1870. He had some difficulty in swallowing liquids. There was no pharyngitis. He had lost much in weight; his appetite and digestion were poor. Dulness on percussion at the left summit, in front and behind, was marked, together with weakened respiratory murmur and subcrepitant rales. The subsequent history is unknown.

There are good reasons for at least the suspicion that in these two cases the laryngitis either followed or was coincident with the occurrence of the pulmonary affection. The following are the reasons: It is probable that the pulmonary affection may precede, for a certain period, cough and expectoration. These symptoms, in the early part of the history of phthisis, are due to circumscribed bronchitis, which, as has been seen in Chapter II. (*vide* page 61), is consecutive to the pulmonary affection. Hence the absence of cough in these two cases prior to the laryngitis is not positive evidence that there was no affection of the lungs. Again, the cough which attends the development of phthisis is generally at first slight and dry, and often for a time scarcely attracts the attention of the patient. A slight, dry cough, therefore, may have existed prior to the laryngitis in these two cases, and its existence have escaped notice. Lastly, noticeable cough may have preceded, and the fact have been forgotten by the patients.

I have dwelt upon the point whether laryngitis is always secondary, because, if it be so, of course the question as to phthisis ever being in any measure dependent on the laryngeal affection is completely disposed of. It seems vastly probable that the affection of the larynx takes place invariably after, or at least coincidently with, the occurrence of the pulmonary affection. I admit, however, that this is not fully proved. But if neither coincident nor secondary, nothing can be more certain than that the instances in which laryngitis has precedence are exceptions to a rule which is almost, if not entirely, constant; and, hence, the facts developed by this anaylsis afford very little, if any, ground for the doctrine expressed by the name "laryngeal phthisis." The rational doctrine in respect of the etiology of the laryngitis is, that it depends on whatever stands in a causative relation to the pulmonary affection; that is, both have a common causation.

Another chronological point of inquiry relates to the length of time between the occurrence of the pulmonary affection and of the laryngitis in the cases in which the latter was undoubtedly consecutive. The histories in 34 cases contain information on this point. The shortest time specified is three weeks; the longest time is noted loosely as many years. It is noted as several years in 4 cases. It was six years in 1 case, five years in 1 case, and four years in 2 cases. It was between two and three years in 4 cases, and between one and two years in 43 cases. The time was noted as "several months" in 5 cases. In the remaining cases the time was—"soon," 3 cases; ten months, 1 case; six months, 1 case; "few months," 1 case; five months, 2 cases; three months, 1 case, and two months, 2 cases. These facts show that laryngitis much oftener occurs months and years after the occurrence of the pulmonary disease than within a short period. The facts also show a wide diversity in different cases with respect to this point. There is no law of chronology in relation thereto; and this is consistent with the doctrine that there is no direct consecutive connection between the two affections. From the great difference, in different cases, in the length of time between the occurrence of the pulmonary disease and that of the laryngeal affection, it follows that there is no particular stage in the progress of phthisis which especially favors the occurrence of laryngitis. This is also fully shown by comparing the morbid changes in different cases, as these changes are either disclosed by post-mortem examinations or represented by physical signs during life.

The occurrence of chronic laryngitis in 13 out of 34 cases, after pulmonary disease had existed for more than two years, suggests another point of inquiry, namely, What apparent influence has the laryngitis upon the fatality and duration of phthisis? Of the 61 cases, in 34 the termination is not noted. Of the remaining 27 cases, in 2 the interference with alimentation, in consequence of the laryngitis, probably hastened death. In 13 fatal cases the duration of life after the occurrence of the laryngitis is noted as follows: three years; two years; more than one year and a half; fourteen months; about a year; seven months; about six months; five months in 2 cases; four months; three months in 2 cases; and one month. In two of these cases the immediate cause of death was perforation of the lung and pneumo-hydrothorax. In one case there was intestinal ulceration and lardaceous liver, as determined after death. In one case the immediate cause of death was uræmia; and in another case there was chronic disease of the kidneys. These facts certainly go to show that the laryngeal affection does not have an untoward influence on the duration of phthisis, irrespective of the interference with alimentation, which the affection sometimes occasions. This conclusion is consistent with other facts derived from an examination of my cases.

In three cases recovery from the pulmonary affection is noted. In one of these three cases the patient was in good health six years after he had been under my observation, the condition of his voice not being noted. In another case the patient is now in good health, sixteen years after the occurrence of the laryngitis, together with other symptoms, and with signs which denoted unequivocally tuberculous disease of the lungs, harshness of the voice in this case still persisting. In the third case, six months after a consultation with me, laryngitis having then existed for six months, and the signs of phthisis being unequivocal, the patient reported by letter that he was free from cough, and apparently perfectly well.

Moreover of the 34 cases in which the termination is not noted, the subsequent history not having been obtained in a considerable number, namely, 11, there was either an apparent arrest of the phthisical affection, or the general condition of these patients was good notwithstanding the existence of the pulmonary disease. I subjoin a brief account of these cases.

Case 1. Mr. L., aged 24, clerk in a dry goods store. Cough and the evidence of laryngitis were coincident, and had existed for four years when he consulted me in November, 1829. A slight hæmoptysis had occurred prior to the cough. There was depression at the summit of the chest on the right side, with dulness on percussion, broncho-vesicular respiration, subcrepitant rales and an undue transmission of the heart-sounds. This patient did not present a morbid appearance; his strength was good, and he did not consider himself an invalid.

Case 2. Dr. T., a medical practitioner, aged 29, consulted me in New Orleans, in November, 1860. In the preceding June he had had hæmoptysis, the hemorrhage profuse and repeated for several days in succession. At the time of this attack he supposed himself to be perfectly well. Persistent cough dated from that attack. In September, 1860, he had pleurisy of the right side with large effusion. Absorption was rapid, and afterward there was progressive improvement in weight and strength. At the time of his seeing me, November 1st, 1860, he was travelling for health. He was thin, pallid, and feeble. He had shortly before this had a second profuse hæmoptysis, the expectoration was now small, the appetite and digestion were good, the right side of the chest was much contracted, the respiratory murmur on this side was everywhere feeble, but signs denoting solidification of lung were not appreciable. In February, 1861, he again consulted me, meanwhile he had gained in weight 20 pounds; he had no cough, and he considered himself well enough to return to his practice. Shortly after this he had another hæmoptysis, raising about eight ounces of blood; but in March he felt well and strong, weighing as much as ever before, and he resumed his practice in Tennessee. In October, 1864, he consulted me in New York. Laryngitis had then existed for two years. He had considerable cough and expectoration, and was thin, but his muscular strength was good. Appetite and digestion were excellent. The right side of the chest was still much contracted; dulness on percussion was relatively morbid at the summit, and there were subcrepitant rales in this situation. No further record of the case.

Case 3. Mr. B., aged 57, consulted me in June, 1862. He stated that several years prior to this date he had cough, with some emaciation, debility, and slight hæmoptysis, and that he recovered; but that for the few preceding months his voice had been affected. He now spoke in a husky whisper. He had never had syphilis. There was slight cough with small expectoration. He was not below his healthy standard of weight and strength. His aspect was not morbid. The appetite and digestion were generally good. There was slight dulness on percussion at the left summit of the chest, with relatively feeble respiratory murmur. No further record.

Case 4. Mr. H., aged 32, merchant, consulted me in September, 1858. He stated that four years prior to this date he had cough, lost weight, etc. He took a sea voyage and recovered entirely. In October, 1857, the cough returned and persisted. Within a short period laryngitis had occurred. He was about 20 pounds under his weight of health. His aspect was not morbid. He was not feeble. The appetite and digestion were good. He had granular pharyngitis. There was marked dulness on percussion at the summit of the left side of the chest in front and behind, with diminished costal movements, increase of vocal resonance, feeble broncho-vesicular respiration, and undue transmission of the heart-sounds. No further record.

Case 5. Mr. B., aged 35, country merchant, consulted me in April, 1865. He had then chronic laryngitis, the length of time which it had existed not being noted, and the physical signs showed a small affection of the lungs. There was loss of voice. He saw me again in October, 1865. There was no improvement in his voice. The signs now noted were slight dulness at the summit on the left side and broncho-vesicular respiration. His general condition at this time was good. He went to Minnesota, and in November, 1866, he was living in St. Paul. He had gained much in weight, and there was some improvement in his voice. This patient died in 1867. The improvement in his voice was temporary, and at the time of his death he was only able to speak in a whisper.

Case 6. Mr. B. consulted me in November, 1862. Cough commenced in the spring of this year, and soon afterward there was evidence of laryngitis. The cough and expectoration were slight. He was 20 pounds under his weight in health, but he had lately gained in this regard. His aspect was not morbid. The appetite and digestion were good. At the summit of the chest on the right side there was dulness on percussion, with some depression, deficient motion, notably feeble respiratory murmur, increase of vocal resonance, and undue transmission of the heart-sounds. At the summit on the left side the respiration was jerking.

Case 7. Mrs. O., aged 35, consulted me in September, 1866. Cough and expectoration, both slight, had existed for four years. Laryngitis had occurred not long after the commencement of these symptoms, and had continued; the voice was now quite husky. She presented a healthy aspect. The appetite, digestion, nutrition, and strength were good. She had chronic granular pharyngitis. The physical signs were dulness on percussion at the summit of the chest on the left side in front and behind, feeble, broncho-vesicular respiration in that situation, subcrepitant rales and undue transmission of the heart-sounds. No further record.

Case 8. Mr. H., aged 30. Laryngitis had existed for a year. It is not noted how long previous to this, cough and expectoration had existed. These latter symptoms were slight. He was but little below his healthy standard of weight. His aspect was not morbid. The signs were, depression in left infra-clavicular region, dulness on percussion, prolonged and interrupted expiration, increased bronchial whisper, and, with auscultatory percussion, cracked-metal resonance. No further record.

Case 9. Mr. H., aged 33, consulted me in September, 1868. Cough and expectoration had existed for three years. Laryngitis had existed for nearly this period. He had never had syphilis. He was now up to his standard of health as regards weight and strength. The signs were, cracked-metal resonance in the left infra-clavicular region and cavernous respiration; elsewhere the respiratory murmur was vesicular. No further record.

Case 10. Mrs. V., aged 50, consulted me in May, 1870. Cough had existed for a year and nine months. Laryngitis had existed for six months. She now weighed more than ever previously in her life. Her aspect was healthful. The menses, which were suspended for several months, now recurred with regularity. The signs were, dulness on percussion and cracked-metal resonance in the right infra-clavicular region, broncho-cavernous respiration in that situation, and behind at the summit the respiration was broncho-vesicular. No further record.

Case 11. Mr. Mc., aged 35, consulted me in September, 1870. Laryngitis had existed for eighteen months. This was preceded by a slight cough which he did not deem of importance. He had never had syphilis. He had gained in appetite, weight, and strength, and his general condition was now good. The signs were, dulness on percussion at the summit of the chest on the left side, increased vocal resonance and whisper, and undue transmission of the heart-sounds. This patient afterward became insane and died, the immediate cause of death not having been ascertained.

Case 12. B. D., aged 30, laborer, admitted into the hospital December, 1856. He had cough two years before this date, which continued through the winter of 1854–55. He had had no cough from May, 1855, to February, 1856. On his admission there was dulness on percussion at the left summit of the chest, with broncho-vesicular respiration and bronchophony. He left the hospital after a week, and re-entered in October, 1857. Laryngitis had existed for several months. He had labored most of the time since he left the hospital, *i. e.*, for about ten months. He complained now of want of breath on exercise. The feet and toes were bulbous. At the left summit of the chest, dulness was more marked, and the respiration was broncho-cavernous. In May, 1858, he had much improved as regards the pulmonary symptoms, his general condition, and his voice. In September, 1858, it is noted that the improvement had been progressive. In March, 1859, it is noted that the improvement had continued to be progressive, the evidence of laryngitis still persisting. The signs showed considerable solidification with cavity at the left summit, and the fingers and toes were greatly bulbous. No further record.

One of the two cases in which the evidence of laryngitis was stated to have preceded the pulmonary symptoms, should be included in this list. (*Vide*, the first of these two cases, page 126.)

Case 13. In this case the termination is noted as fatal, but the patient died from anæmia. The history of the case, as regards the laryngitis, has a striking bearing on the point which this series of cases illustrates. Mr. R., aged 22, consulted me first in August, 1867. Cough had existed for three months, and laryngitis during a part of this period, the precise time not noted. The signs were, feeble and broncho-vesicular respiration at the left summit of the chest, subcrepitant rales, increase of vocal resonance and undue transmission of the heart-sounds. His aspect was healthy, and his general condition, as regards weight and strength, good. The symptoms and signs did not denote any apparent progress of the pulmonary affection of the lungs, but the voice remained husky, when, during the winter of 1869–70, he became dropsical, and the urine gave evidence of renal disease. The dropsy became great, and he had uræmic convulsions. Death took place in July, 1870.

The foregoing cases (excluding the last case) constitute more than one-third of those the subsequent histories of which were not noted. They certainly show that the probabilities of arrest, non-progression, or slowness of progress, in cases of phthisis, are increased, rather than diminished, if laryngitis take place; excluding, of course, the instances in which the laryngitis interferes with alimentation. A patient with phthisis, who has laryngitis, provided there be no difficulty in deglutition, is more likely to recover from the pulmonary affection, and, if the ending be not in recovery, the chances are greater of a stationary condition of the pulmonary affection, or of a long duration of the disease, with a fair amount of general health, than if laryngitis had not taken place. *À priori* reasoning would hardly lead one to regard laryngitis in the light in which it is made to appear by these clinical studies. Accepting the latter as by far the most reliable, any explanation which might be offered of the facts reached by these studies would be conjectural, and, therefore, not in accordance with their spirit.

What is the prognosis, as regards recovery from laryngitis, in cases of phthisis? In none of my cases was the restoration of the voice complete; it remained more or less husky. In several of the cases there was more or less improvement in this regard. It is probable that the huskiness of voice, or even aphonia, may remain in consequence of a permanent thickening of the membrane; ulcerations, if they existed, having healed, and no laryngeal inflammation remaining. In one case in which huskiness still persists, recovery from the pulmonary affection having taken place many years since, this has been ascertained to be the fact. Laryngoscopic examinations, of course, are adequate for determining whether huskiness and aphonia be properly a sequel of laryngitis, or a symptom of existing inflammation or ulceration. As my histories do not embrace these examinations, I shall pass by this point. I will only add that, in several of my cases, local treatment was employed. I have repeatedly resorted to the application of a solution of the nitrate of silver by means of a sponge attached to a curved probang. Sometimes this has seemed useful, but in general it has proved to be of little or no use. In some of my cases which had been treated topically by those who make this a specialty, as a rule, not much, if any, benefit was obtained.

Recapitulating the conclusions to which the foregoing clinical studies relating to laryngitis lead, they are the following:—

1. Chronic laryngitis is of frequent occurrence in cases of phthisis.
2. It occurs much oftener in men than in women.

3. An important difference, in different cases, pertains to interference with deglutition. In most cases there is no interference, but in some cases paroxysms of cough and spasm of the glottis are excited, and liquids are apt to be rejected through the nostrils. The interference may be so great as to restrict alimentation, and in this way hasten a fatal termination.

4. There is almost no liability to the supervention of acute laryngitis, or of œdema of the glottis; and, aside from spasm of the glottis in the act of swallowing, in some cases, the laryngitis does not occasion obstruction to breathing.

5. In the vast majority of cases the laryngitis is secondary to the pulmonary disease; in some cases the pulmonary disease and the laryngitis appear to occur coincidently, and in a very few cases the laryngitis seems to precede the pulmonary disease; but there is reason to think that in these exceptional instances, tubercles in the lung may exist either prior to, or coincidently with, the laryngeal affection.

6. In the majority of cases the laryngitis occurs after a considerable period from the date of the occurrence of the pulmonary disease; this period, in more than one-third of the cases, being from two to four years.

7. The diversity, in different cases, in the interval of time between the date of the pulmonary disease and the occurrence of laryngitis, the fact that the two affections appear sometimes to occur coincidently, and the want of any uniformity in different cases as regards the amount of pulmonary disease, and the stage of its progress when the laryngitis occurs, render it a rational conclusion that the laryngitis is not dependent on the disease of the lungs, but that it proceeds from the same internal cause which determines the latter.

8. Exclusive of the cases in which the laryngitis interferes with alimentation, it does not have an untoward influence on the duration of the disease in the cases which sooner or later end fatally.

9. The chances of recovery from phthisis are not diminished by the occurrence of laryngitis, provided alimentation be not interfered with.

10. The chances of arrest of the pulmonary disease, or of its being non-progressive, and of a slow progress, are greater instead

of being diminished, when laryngitis occurs, provided alimentation be not interfered with.

11. The changes incident to laryngitis, in cases of phthisis, occasion permanent huskiness of the voice, if not aphonia.

12. The prospect of much benefit from the topical treatment of laryngitis in cases of phthisis, is small.

Pneumonia.

Pneumonia is occasionally either a complication or an intercurrent affection in cases of phthisis. I mean by the term pneumonia either the ordinary lobar form, or a circumscribed pneumonia which is pathologically identical, being characterized, anatomically, by an intra-vesicular product which is readily absorbed, leaving the pulmonary structure intact, called by German writers croupous pneumonia. Exceptionally it leads to purulent infiltration or abscess. The necessity of defining this sense of the term arises from its having been of late applied, with various prefixes, to what is commonly known as tuberculous infiltration, in other words, to chronic phthisis, the intra-vesicular product in the latter affection being with difficulty absorbed, and leading to destruction of the pulmonary structure. Pneumonia, as just defined, occurring in cases of phthisis, may present all the characters, clinical and anatomical, of acute lobar pneumonia. Its occurrence in connection with phthisis is simply a coincidence—that is, the latter disease has nothing to do in the causation. This is a fair conclusion in view of the infrequency of the occurrence of lobar pneumonia, as an intercurrent affection in cases of phthisis. The clinical studies of Louis, Andral, and Grisolle established long ago the fact that an attack of lobar pneumonia occurring in a patient affected with phthisis, but not greatly reduced thereby, generally ends in recovery. The existence of the phthisical affection does not have an untoward influence upon the pneumonia. This holds true in some cases in which phthisis is advanced to the formation of cavities.[1] Moreover, an attack of acute lobar pneumonia in many cases does not appear to exert an untoward influence upon the progress of phthisis. The two following cases are illustrative of intercurrent pneumonia ending favorably:—

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[1] *Vide* Traité Pratique de la Pneumonie, par Grisolle. Paris, 1841. Page 555.

Case 1. Dr. B., aged 28, had hæmoptysis, preceded and followed by cough, impaired strength, etc., in the spring of 1855. After a sea voyage he recovered his strength, but the cough and expectoration continued. In the winter of 1856–7 he performed the duties of a demonstrator of anatomy, and his general health failed during this winter. In April, 1857, he had an attack of pneumonia, the lower lobe of the left lung being affected. He recovered slowly. After his recovery he presented the following signs: dulness on percussion, and depression at the summit of the chest on the left side, with deficient superior costal motion and broncho-vesicular respiration. His aspect was not morbid, and his strength was good. He married in 1858, and, at that time, was actively engaged in medical practice. He gradually failed, and died in November, 1859.

The pneumonia in this case apparently had no unfavorable influence upon the tuberculous disease.

Case 2. Mr. W., aged 25, clerk, New Orleans, was seen by me, in connection with Dr. Howard Smith, in November, 1859. He had had slight hæmoptysis, and cough had existed for a few weeks only. The signs at this time were not noted, but simply the statement that they denoted a small affection. He went into the country, and returned in December. I saw him, with Dr. Smith, shortly after his return. The signs then denoted moderate solidification at the summit of the lung on the right side, but there was evidence of complete solidification of the lower lobe, namely, notable dulness on percussion, bronchial respiration, bronchophony, and bronchophonic whisper. He was quite weak; the pulse was 120, and the expectoration was rusty. Restoration took place slowly; it was, however, progressing when I last saw him in the middle of January, 1860. He was then about the room, and gaining daily in strength. In the middle of March he was well enough to return to his business. In October, 1860, Dr. Smith informed me that the patient had had tolerable health during the summer. He failed during the following winter, and died in March, 1861.

In this, as in the preceding case, the pneumonia did not seem to influence unfavorably the phthisical affection.

In three cases an intercurrent pneumonia occurred shortly before death. In one of these three cases phthisis had existed eighteen months. The patient had had numerous recurrences of hæmoptysis. The physical signs denoted cavities in the upper lobe of the left lung. He was quite feeble, when the signs and symptoms appeared to show the occurrence of pneumonia affecting the lobe just named. The details are not recorded, and there was no autopsy. It is simply noted that the immediate cause of death was probably pneumonia affecting the upper lobe of the right lung, the mode of dying being asthenia.

In another of these three cases cough had existed for several years. The signs showed an affection of the upper lobe of the right lung. He was attacked with pneumonia affecting the lower lobe of this lung. Several days after the date of the attack he had uræmic convulsions. These were followed by general dropsy. Death took place a month after the date of the attack of pneumonia; and meanwhile the upper lobe, as well as the lower, became affected. The urine was highly albuminous.

In the third case the signs showed an affection at the summit of the right lung. There was an aortic direct, and also a mitral regurgitant, cardiac murmur. The pneumonia attacked first the lower lobe of the right lung, and subsequently the upper lobe was invaded. The immediate cause of death was thrombosis of the right cavities of the heart. On a post-mortem examination the whole of the right lung, excepting the apex, was found in the second stage of pneumonia. At the apex were nodules and cheesy exudation, but no cavity. The right ventricle was filled with dense, white fibrin, firmly agglutinated to the ventricular walls, and closely intertwined with the tendinous cords, papillary muscles, and trabeculæ. The aortic valves were calcified. The left lung weighed 15½ ounces; the right lung 49 ounces.

In the first of these three cases the fatal result may be attributed to the feebleness of the patient; in the second, to coexisting renal disease, and the affection of an entire lung with pneumonia; in the third, to coexisting disease of the heart, and an affection of an entire lung. It is evident that these cases do not conflict with the statement that lobar pneumonia, in cases of phthisis, provided the vital powers have not been greatly reduced, and the pneumonia affect only a single lobe, does not *per se*, as a rule, destroy life.

In the foregoing five cases, the pneumonia had the usual characters of the lobar form of this disease, and, with the exception of one case, the lobe either primarily or exclusively affected was a lower lobe, the tuberculous affection being seated in the upper lobe of the same lung. Pneumonia, however, in some cases, is circumscribed, that is, it does not extend over an entire lobe, and the situation is proximate to the phthisical affection. In these cases, the solidification which the signs denote is liable to be considered as belonging wholly to the phthisis, and, hence, the amount of the latter disease may be greatly over-estimated. The following case will serve as an illustration.

Mr. B., aged about 30, was seen by me, in consultation with Dr. Conklin, of Brooklyn, in April, 1866. For some time previous to this date he had had a slight cough, and some want of breath on active exercise. Up to a few days before my visit he had kept about actively engaged in business, and at the time of my visit he was up and dressed, his chief complaint being a want of breath on any exertion. The physical signs gave evidence of considerable solidification of the upper lobe of the right lung. The question was, whether the solidification was due exclusively to phthisis, or whether, with this disease, a circumscribed pneumonia was associated. This question was settled definitively by an examination of the chest six weeks afterward. At the time of this examination, the solidification had in a great measure disappeared; there was now only slight dulness on percussion, with feeble respiratory murmur and increase of vocal resonance. Meanwhile, the symptoms had denoted progressive improvement. The cough was now slight; he no longer suffered from want of breath on exertion, and he had improved as regards appetite, strength, etc. This patient consulted me seven years and four months afterward. In the mean time he had considered himself in fair health, but he had been subject to frequent cough, and for the preceding six months the cough had been persistent. There was now distinct dulness at the summit of the chest on the right side, with feeble broncho-vesicular respiration, increase of vocal resonance, undue transmission of the heart-sounds, and subcrepitant rales. He had held his weight and strength, and his appetite and digestion were good. The axillary temperature was 99½° F.

Instances like the foregoing have repeatedly fallen under my observation. The evidence of a circumscribed pneumonia having occurred is, a rapidly induced solidification notable in degree and extent, resolution taking place in the course of a few days or weeks. The latter is inconsistent with the history of solidification from phthisical exudation. In this affection, the absorption of the intra-vesicular product, if it take place at all, is extremely slow; and if the solidification be nearly or quite complete, and its extent be considerable, probably resolution never occurs, softening and the breaking down of the pulmonary tissue being invariable, provided life be sufficiently prolonged. Herein consists an essential difference in the history of a simple pneumonia and that which belongs to phthisis. It is obviously of practical importance, especially with reference to prognosis, to recognize the occurrence of a circumscribed pneumonia, not phthisical in character, but associated with phthisis, and situated in proximity to the pulmonary affection. The diagnostic points are, the rapidity of the solidification, together with its degree and extent, the sudden development of symptomatic fever as denoted by the pulse, axillary temperature, etc., and perhaps the characteristic rusty expectoration. If, however, the circumscribed pneumonia have not been developed under observation, its occurrence can for a time only be suspected, and it is necessary to wait until the resolution affords proof of its having occurred.

Pleurisy with Effusion.

The phrase "pleurisy with effusion," is used in distinction from the dry, circumscribed pleurisies which are of almost invariable occurrence in cases of phthisis. I find in my collection ten cases in which there was pleurisy with either a considerable or a large effusion of liquid. In all these cases the pleurisy was consecutive to the tuberculous disease. The first point of inquiry relates to the importance of this event as regards a fatal termination. In four cases death took place without recovery from the pleurisy. In one of these cases thoracentesis was employed, afterward there was perforation of the lung, and the post-mortem examination showed recent pericarditis, peritonitis, disease of the kidneys, and pyelitis. The pleurisy in this case was double, a gallon and a half of turbid serum being found in the right, and a pint in the left, pleural sac. The pleura and the peritoneum were studded with miliary tubercles, and there is no note of solidification or of cavity in the lungs. It is evidently difficult to estimate, in this case, the agency of the pleurisy in determining the fatal termination.

In another of the four cases there was double pleurisy. A synopsis of the history of this case is as follows: Caspar A., aged 27, tailor, was admitted into hospital June 13th, 1855. Cough, which followed an attack of acute articular rheumatism, had existed for three months. He had kept the bed for nine weeks. He was now feeble, pallid, and emaciated. He had a copious expectoration. Death took place ten days after his admission. The post-mortem examination showed double pleurisy with considerable effusion in both sides. On the right side the lung was adherent above the fourth rib, and the liquid extended to this point. On the left side there was a partial adhesion, and the amount of liquid is noted as considerable. In both sides the liquid was turbid, and contained flakes of lymph. Both lungs were thickly studded with small tubercles, none of which exceeded in size a small pea. They were most abundant on the right side. The surface of the heart was roughened with lymph, and the pericardial sac contained from three to four ounces of turbid serum. In this case pericarditis was added to the pleurisy, and, doubtless, was in fact the immediate cause of death. The case illustrated the difficulty, when effusion exists in both sides, of determining by physical signs the existence of tubercles. The resonance on percussion at the summit of the chest was intense and vesiculo-tympanitic on both sides, more so on the right than on the left side, and the respiratory murmur on both sides was intensely vesicular. Aside, however, from the previous history and symptoms, tuberculous disease was to be inferred positively from the existence of double pleurisy with effusion, after the law long since established by Louis.

Of the four cases, in the two which remain, the pleurisy with effusion seemed to be immediately concerned in the fatal termination. In neither of these cases, however, was a post-mortem examination made, and there may have been circumstances contributing to this termination which were not discovered during life. I subjoin a brief account of these two cases.

Case 1. Mr. C., aged 27, printer, temperate, came under my observation about six weeks after the commencement of cough which had since continued. He was at this time feeble and pallid. He had lost considerably in weight. It is noted that the signs showed considerable solidification at the summit of the chest on the right side. Nine days afterward he had lancinating pain in the left side of the chest. On the day but one after this occurrence, the signs were considered as showing considerable pleuritic effusion in the left side. There were incoherency and muscular tremor. The pulse was rapid. The tongue was dry and hard. Death took place by asthenia on the seventh day from the date of this acute attack. The attack was ushered in by a chill with rigor, and it may be a question whether the affection was not pneumonia or pleuro-pneumonia. The chill and rigor would suggest this question. The patient was not seen by me nor by any physician after the attack until the third day. It is noted that there was then flatness on percussion with absence of respiration over the lower and middle thirds. The vocal and tactile signs are not noted. There was no rusty expectoration. My opinion now is, that there is room for doubt whether the affection was purely a pleurisy. The case was noted in 1851.

Case 2. Capt. W., seaman, aged 40, had had cough and expectoration for some time, and hæmoptysis had occurred two weeks before he came under my observation October 6, 1852. At this time there was flatness on percussion over the greater part of the left side of the chest, with enlargement of this side, and loss of the intercostal depressions. There was absence of respiratory sound on this side except at the summit, and here the respiration was cavernous. The previous history showed thât the pleurisy had occurred within two weeks. It occurred while he was undergoing the discipline of a water-cure establishment. He had a copious nummular expectoration. The subsequent history was not ascertained. It is only noted that his death took place early in the following November. Like the preceding case, it is not certain that the death was due to the pleurisy. There may have been other complications which were the immediate occasion of the fatal termination. It will thus be observed that these cases do not warrant any positive conclusion as regards the importance of unilateral pleurisy with effusion as regards a fatal termination.

Deducting from the ten cases the four of which an account has been given, six cases remain. In these six cases the patients recovered entirely from the pleurisy. I shall give a brief abstract of the history of each of these six cases.

Case 1. Judge G., aged 37, gave a retrospective history of phthisis in 1851, from which he apparently recovered. The disease appeared to return in 1856. He passed the winter and spring months of this year in Aiken, N. C., and improved notably as regards weight and strength. Cough, however, still persisted. In July, of this year, he came under my observation, and on examination of the chest I found depression and diminished motion at the summit on the right side, with bronchovesical respiration. In December, 1857, he had pleurisy with large effusion. He recovered from this affection, but subsequently died with phthisis, the date of his death and other details not having been ascertained.

Case 2. Dr. C., aged 25, was attacked with hæmoptysis in March, 1858. On examination of the chest, relative feebleness of the respiratory murmur at the left summit of the chest was the only sign discovered. Shortly after this he had acute pleurisy affecting the left side. I examined the chest in May, 1858. The left side was much contracted, and there was a pleuritic friction murmur. His general health was now good. He married in the autumn of this year. I met him casually in the spring of 1859. He reported himself to be in fair health, but he looked pale and thin. He died with phthisis in July, 1860.

Case 3. Mr. P., planter, age not noted, of very active habits, and fond of fox hunting, temperate, a year after the commencement of a persisting cough, had pleurisy with a large effusion. He was unable to lie down for five weeks. He recovered from the pleurisy, and a year afterward was well enough to resume his active life on his plantation in Mississippi. He had then his usual health. Slight cough with small expectoration continued. The left side of the chest was much contracted, and the signs denoted a moderate affection at the summit on the same side.

Case 4. Dr. T., aged 29, cough having existed for four months, and hæmoptysis having occurred, had pleurisy with large effusion affecting the left side of the chest in Sept. 1860. The liquid was rapidly absorbed; two months after the date of the attack of pleurisy there remained no effusion. There was considerable contraction of the affected side. Shortly after recovery from the pleurisy, he had a profuse hæmoptysis, and another in February, 1861. In March, 1861, he returned to the practice of medicine, having regained his weight of health, and feeling as strong as ever in his life. In Oct. 1864, he was in fair health. He had had laryngitis for two years. He had considerable cough and expectoration, and the signs showed, with contraction of the left side, an affection at the summit on this side.

Case 5. Mr. N., aged 27, came under my observation in August, 1865. Nineteen months prior to this date he had profuse hæmoptysis; and two attacks had subsequently occurred, both being profuse. Cough was slight, and his general health was good. There was slight dulness on percussion at the summit on the left side with broncho-vesicular respiration. In January, 1866, during a voyage to Europe he was attacked with pleurisy. He consulted, in London, the late Dr. Hyde Salter, who found considerable effusion in the right side. In October, 1866, he had the aspect of perfect health, and was entirely free from any pulmonary symptoms. In 1868 he removed to Minnesota, and was in robust health in 1873.

Case 6. James L., aged 20, bartender, was admitted into hospital in July, 1861. Persistent cough had existed for two and a half years, and during the first three months he had repeated attacks of hæmoptysis. The history showed the occurrence of pleurisy with effusion a year before his admission. Laryngitis had existed for a year. The left side of the chest was notably contracted. At the summit there was marked dulness on percussion with bronchial respiration and bronchophony. He improved remarkably in hospital, and was able to perform the duties of an assistant orderly man of the hospital ward. He left the hospital in the summer of 1862, and returned in the following winter. He gained gradually during the winter and spring, and died in the summer of 1863 (date of death not noted).

So far as these cases warrant any conclusion, it is, that unilateral pleurisy with effusion is not of importance as regards a fatal termination; in none of the cases did it appear to have any agency in causing death. The cases suggest a second point of inquiry, namely, what importance has the pleurisy as regards the progress of phthisis? Now, with reference to this point of inquiry, in none of these six cases, as there is reason to believe, did the occurrence of unilateral pleurisy with effusion have an unfavorable influence on the phthisical disease. On the other hand, the histories afford ground for the supposition, that whatever influence the pleurisy may have had was salutary rather than otherwise; in other words, the histories, in most of the cases, are consistent with the belief that, by means of the compression of the lung, or in some other way, a pleuritic effusion may arrest or retard the progress of phthisis. It is perhaps warrantable to say that, as a rule, provided phthisis be not already far advanced, the occurrence of a simple unilateral pleurisy with effusion, from which the patient recovers, is not an untoward event as regards the phthisis.

Excluding the two cases of double pleurisy, the pleuritic effusion was in the left side in six, and in the right side in two of the remaining eight cases. It was in the side either exclusively or chiefly affected with the phthisical disease in six, and in the opposite side in two cases. In all of the ten cases the patients were of the male sex.

Perforation of Lung.

Among the cases in this collection I find 24 in which there was perforation of lung, followed by pleurisy and pneumothorax. Of three cases the histories are incomplete as regards the termination; but it is quite certain, judging from the symptoms noted, that these cases ended fatally. In the remaining 21 cases the termination was fatal. In 12 cases post-mortem examinations were made, and an account of the morbid appearances is given in Chapter I. (*Vide* page 35.)

In 11 cases the date of the perforation was determinable by the sudden occurrence of pleuritic pain which was generally intense and either accompanied at once, or quickly followed by, dyspnœa. The dyspnœa, which was generally for a time intense, as a rule subsided after a few hours or days. In one case the patient, a laborer, worked for several days after (judging from the history) the perforation occurred. He did so, however, with great difficulty. In the remaining 13 cases the date of the perforation is not determinable; but this, in most of the cases, is owing to the histories being defective with respect to that point. Almost always the occurrence of pleuritic pain and dyspnœa renders it easy to determine retrospectively when the perforation took place. This is not invariably true. In one of my cases the patient declared that pain and dyspnœa were developed gradually, and the precise time when the perforation occurred could not be ascertained. In most of the 11 cases in which the date of the perforation was determinable, there were apparently exciting causes. In 4 cases it occurred during paroxysms of coughing, accompanied, in 1 case, by retching; in 1 case it was after active exercise in walking; in 1 case while the patient was rolling a barrel of sugar; in 1 case just after getting into bed; in 1 case just after a hearty meal; and in 1 case, the patient a woman, while at work as a domestic. In 1 case the pneumothorax followed thoracentesis, the previous occurrence of perforation not being known. The patient, a man aged 25, clerk, was admitted into Bellevue Hospital September 10, 1866. He stated that ten weeks prior to his admission he had pain in the right side of the chest, with want of appetite and weakness; and, after two weeks, was obliged to quit work. He had also cough and dyspnœa; but it is not noted whether cough preceded the pain and want of breath. On his admission the right side was dilated with liquid. As he suffered much from dyspnœa on any exertion, thoracentesis was employed, a small trocar and Davidson's syringe being used. Much immediate relief followed the operation, and his symptoms for several days denoted improvement. The existence of pneumothorax was ascertained a week afterward. Prior to this, vocal resonance and vesicular respiration extended from the summit downward a considerable distance on the right side. He became greatly enfeebled, and death took place November 7, 1866. On a post-mortem examination, the right pleural sac was found to contain a large quantity of sero-lymph. The lung on this side was greatly compressed. Inadvertently the condition of this lung was not noted. The left side contained a small quantity of sero-lymph, and the left lung was studded with miliary tubercles. In this case there were also recent pericarditis, peritonitis, and disease of the kidneys.

There are two explanations of the pneumothorax which followed the thoracentesis in this case. One is, that the perforation took place from the rupture of a cavity some days after the operation, no perforation having before existed, and the partial expansion of the lung in consequence of the withdrawal of liquid favoring its occurrence. The other is, that perforation had taken place prior to the patient's admission into the hospital, the pleural sac afterward becoming filled with liquid, the air being absorbed, and thus the pneumo-hydrothorax being converted into simple pleurisy with large effusion. If the latter be the correct explanation, the perforation had become closed after the compression of the lung from the accumulation of liquid, and the closure was sufficiently firm to resist for some days the pressure of the air in the expansion of the lung; but at length a reopening of the perforation occurred. That this is the more probable explanation is shown by two other cases in which perforation, with pneumothorax, was known to have existed prior to the filling up of the pleural sac with liquid, in both cases pneumothorax being reproduced after thoracentesis. The following are abstracts of these two cases:—

Case 1. B., male, aged 30, admitted into Bellevue Hospital September 4, 1861. Cough, with expectoration, had existed for ten months; but he had kept at work, as a laborer, until shortly before entering the hospital. While rolling a barrel of sugar he felt something give way in the left side of the chest. This was immediately followed by pain and dyspnœa. He worked, however, for several days after this occurrence, but with much difficulty, and then took to the bed. On admission he presented all the signs of pneumo-hydrothorax, excepting that amphoric respiration and voice were wanting. There was loud splashing on succussion. September 6, it is noted that he was up all day, and that he was able to take considerable exercise without inconvenience. The signs remained the same. September 30, he was much improved; he was able to be up and out of doors. There was no change in the signs. My hospital service ended with September, and on resuming service, December 1, 1861, I found this patient still in hospital, and the left side of the chest was now filled with liquid, the heart being pushed to the right of the sternum. He was up and about the ward. The cough and expectoration were slight. January 12, 1862, the liquid having increased, and the patient suffering much from dyspnœa, paracentesis was performed by my colleague, Professor Sayre. A free incision was made, without any effort to prevent the ingress of air. Immediate relief was procured by the operation. Amphoric respiration and metallic tinkling were found afterward. Death took place February 2, 1862. On the post-mortem examination, perforation of the left lung was demonstrated by inflating the lungs, after inserting the nozzle of a pair of bellows into the trachea. The left lung was condensed by pressure; there were small, old cavities near the apex, and no solidification. The right lung contained tuberculous nodules, and portions were emphysematous.

Case 2. Patrick D., butcher, aged 33, was admitted into Bellevue Hospital October 30, 1866. He began to cough in November, 1865, but continued to work until March 1, 1866. He was in Bellevue Hospital from March to May, when he presented the signs of pneumo-hydrothorax. He came under my observation in August, 1866, having re-entered the hospital in the preceding month. At this time the left side of the chest was filled with liquid. He left the hospital September 17, and was again admitted October 30, 1866. The left side of the chest was now greatly dilated, the signs being those of pleurisy with large effusion, all signs of pneumothorax being absent. Shortly afterward, thoracentesis was resorted to, my adaptation of Davidson's syringe being the instrument used. Five or six quarts of purulent liquid were withdrawn. The next day all the signs which are diagnostic of pneumo-hydrothorax were present. November 30, 1866, a free opening into the chest was made by my colleague, Prof. Wood, and a large quantity of pus evacuated. Marked relief followed, but death took place December 5, 1866. On the post-mortem examination, a perforation of the left lung was found, and in the upper part of this lung were softened collections. Numerous nodules were scattered throughout the right lung.

With reference to thoracentesis in cases in which the chest becomes filled with liquid after perforation, there are certain points to be considered. If it be known that pneumothorax has existed, it is to be expected that the removal of the liquid will be followed by the renewal of that affection; the air will again enter the pleural sac through the aperture in the lung. Now, may not the compression of the lung by the liquid possibly, after a time, lead to a permanent closure of the orifice? I have no data for an answer to this question, excepting the single case in which it was presumed that pneumothorax had existed; in this case the signs showing the entrance of air through a perforation several days after the operation. The possibility of a permanent closure of the orifice as a consequence of prolonged compression by the liquid, is a point to be considered; and, with regard to this point, the operation of thoracentesis is of doubtful propriety, provided the accumulation of liquid be not so large as to occasion distress and danger. If the dilatation of the chest be great, and the patient suffer therefrom, thoracentesis is indicated as a palliative measure; but, under these circumstances, when it is known that perforation of the lung had previously taken place, only a certain quantity of liquid should be withdrawn, enough to relieve the suffering, leaving a sufficient quantity to secure continued compression of the lung.

Two of the cases under analysis illustrate the propriety of puncturing the chest, in cases of pneumothorax with great distress from distension, as a palliative measure. The following is a brief account of these two cases:—

Case 1. January 9, 1860, I was requested by my colleague, the late Prof. Penniston, to see a male patient in one of his wards in Charity Hospital, New Orleans. I have not noted the previous history. The characteristic signs of pneumo-hydrothorax were present, the affected side (the left) being greatly dilated, and the heart pushed over to the right side of the sternum. He suffered greatly from dyspnœa. I punctured the chest with a small trocar, giving exit to an abundance of inodorous air, which escaped with force. A small quantity of serum was withdrawn by means of Wyman's apparatus. The affected side was afterward much diminished in size, the heart receded beneath the sternum, and the patient derived great relief from the operation. He shortly afterward was removed from the hospital, and there is no further record of the case.

Case 2. John W. B., aged 23, carpenter, was admitted into my service at Charity Hospital, New Orleans, November 29, 1859. Cough had existed since May, 1858. He had never been confined to the bed, and had never had any medical treatment. His weight was but little under that of health. The appetite and digestion were good. Two days before his admission, during the night, he was seized with acute pain in the chest, followed by great dyspnœa. These symptoms had become less intense at the time of his entering the hospital. The pulse was 120, and the respirations 40 per minute. All the signs characteristic of pneumo-hydrothorax with perforation of the left lung were present. December 12, it was noted that he had much improved as regards the dyspnœa; the left side, however, was greatly dilated, and the heart pushed to the right of the sternum. January 6, 1866, I punctured the chest with a small trocar. The puncture was made just below the lower angle of the scapula. Air escaped for some time with a noise such as is heard when the aperture into an India-rubber cushion is opened. The air was inodorous. A small quantity of serous liquid was removed by means of Wyman's syringe. After the puncture, the size of the affected side was lessened; the heart receded toward the left side, and the breathing of the patient was decidedly better. This relief continued for several days; the affected side of the chest then became as greatly dilated as before the puncture. Twelve days after the operation, the patient left the hospital to go to the house of a friend. He was very feeble, and probably did not long survive his removal. There was no further record of this case.

In both these cases the puncture made with the trocar was closed directly the canula was removed; there was no permanent opening into the chest. In two cases which have recently been under my observation, a free incision was made, and the opening maintained. These cases are not included in the collection under analysis. I was led to make trial of this procedure from its remarkable success in two cases of empyema with consecutive perforation of the lung. In the latter two cases the previous history and the symptoms, together with signs, did not render it certain that there was tuberculous disease. Of the former two cases, one was in hospital, and I have full notes of this case, while under my observation. The patient entered Bellevue Hospital October 18th, 1873, and at that time there were present the signs characteristic of pneumo-hydrothorax. He had been ill five months, and it was not clear, from the account which he gave, when the perforation of lung took place. The right side of the chest has greatly dilated, and he suffered much from dyspnœa. November 7th, the chest was punctured with a small trocar, and thirty-six ounces of serum removed by aspiration with Davidson's syringe. Air also escaped. The operation afforded marked immediate relief. On the 25th of November, the affected side having become again greatly dilated, a free incision was resolved upon. An opening, an inch in length, was made, and after the escape, with air, of two and a quarter quarts of serum, a tent of oakum was introduced. The relief of the dyspnœa was immediate and marked. Afterward, daily, the tent was removed and the chest washed out with tepid water, to which a little carbolic acid was added. Death took place December 7th, twelve days after the second operation. The patient died by asthenia, without any suffering from dyspnœa after the free opening had been made. In this respect, as a palliative measure, the operation was successful, and it is probable that the patient's life was somewhat prolonged. A post-mortem examination in this case was not practicable.

The second case was in the private practice of Dr. Mulreany, of New York. The patient, when seen by me in consultation, November 28th, 1873, presented the signs characteristic of pneumo-hydrothorax. The affected side was much dilated, and the suffering from dyspnœa was great. The perforation occurred seven days before the date of my visit, as was readily determinable by the sudden occurrence of acute pain and dyspnœa, cough having existed for a considerable period, but the patient, at the time of the perforation, being able to be up and about. I suggested a free opening into the chest, which was made on the same day, by Dr. Mulreany. Air escaped forcibly from the chest, together with a small quantity of serous liquid. The patient was immediately relieved. The following notes were made by Dr. Mulreany on the morning of the day before his death: "Pulse 130 and weak. The opening in the side closed since yesterday morning. There is slight cough. He has had a good night. Sweating less. He is perfectly conscious and has some appetite. Respiration is not hurried. Upon the whole he feels rather comfortable." Death took place on the 9th of December. In this case the operation was successful in procuring immediate and permanent relief of dyspnœa. The mode of dying was evidently by asthenia, and it may perhaps be considered as probable that life was somewhat prolonged.

I have referred to two cases in which, as was supposed, perforation of lung was consecutive to empyema, and in which a free opening into the chest was of signal benefit. In these two cases it is assumed that tuberculous disease did not exist, but, in regard to a question connected with a similar procedure after perforation incident to tuberculous disease, these cases are pertinent. The question is this, Is it not possible that this procedure may sometimes lead to closure of the perforation, and even to recovery from pleurisy with pneumothorax? In some cases of phthisis the latter is quite limited at the time of the perforation, and an arrest with complete recovery might take place, were the opening into the lung permanently closed and the pneumo-hydrothorax removed. Now, are not these requisites for recovery possible in some rare instances? With this inquiry I proceed to give abstracts of the two cases referred to. The notes of these cases are very full, and I will condense them very much.

Case 1. John B., aged 33, laborer, was admitted into Bellevue Hospital April 7, 1873. His illness began two months before his admission, and the symptoms at the outset denoted acute pleurisy. The physical signs recorded at the time of his admission showed the presence of liquid in the right pleural cavity, extending about midway from the base to the apex. Pneumothorax did not then exist. The latter was ascertained April 29. Succussion-splashing was on this date distinct. The day previous he had expectorated over 30 ounces of pus. June 6, 18 ounces of thick, yellowish-green pus was withdrawn by aspiration. This was followed by considerable relief. He came under my observation July 1. At this time the patient was extremely feeble and emaciated. The pulse varied from 110 to 120 per minute, and the axillary temperature from 101° to 103°. The fingers were bulbous. There was flatness on percussion over the whole of the right side of the chest, with absence of respiration, vocal resonance, and fremitus. He expectorated, daily, pus in large quantity. He suffered much from dyspnœa. On the 3d of July a free opening into the chest was made, the fifth intercostal space on the axillary line being selected as the place for the incision. Sixty-eight ounces of creamy pus, without odor, escaped. On the following day 14 ounces of pus were removed by means of a catheter introduced through the opening into the chest; and on the 5th of July about 5 ounces escaped in the same way. The pleural cavity was injected with tepid water. The patient was now quite comfortable. On the 7th of July, the chest not having been injected the previous day, 32 ounces of pus escaped. After this date the tent was removed from the opening daily, and the pleural cavity injected with tepid water to which was added a little carbolic acid. On the 14th of July it was noted that the patient had gained daily. The aspect was improved. The appetite was good. The expectoration of pus had ceased, and all the symptoms denoted a very marked change for the better. At this time there was very little purulent discharge through the opening. On the 18th the opening, which had become quite small, was enlarged by a fresh incision, and the daily injections were continued, with the discharge of only a small quantity of pus. On the 31st of July, there being no discharge of pus, the injections were discontinued, and the opening was allowed to close. At this date he weighed 127 pounds, and he had evidently gained much in weight. August 13th his weight had increased to 139 pounds, having gained 11 pounds in one week. September 8th he weighed 143 pounds. The fingers were less bulbous. He had slight expectoration. His aspect was healthy, and he reported well enough to leave the hospital. There was slight dulness on percussion over the whole of the right side of the chest, with feeble respiratory murmur, and some mucous rales at the base. This side was considerably contracted. On the 18th of September I presented this patient at a clinical lecture in the hospital amphitheatre, as having recovered from pneumo-hydrothorax. He considered himself well, and had the appearance of health. Indeed, he had delayed his departure from the hospital for several days in order that I might present him at my clinical lecture on the date just given, which was my first lecture in that autumn. He was to have left the hospital September 20; had he done so, and, like many hospital patients, never been again heard of, I should have supposed that the recovery was permanent. On this date, however, he complained of headache, and he was affected with urticaria. A purgative was prescribed by the house physician. The next day, the bowels not having been moved, he was directed in the morning to take a powder of rhubarb and soda, and at night ten grains of calomel with a scruple of the bicarbonate of soda, were given. These remedies failed to produce a cathartic operation, but occasioned vomiting. On the 22d he was suddenly seized with great dyspnœa and pain in the chest, together with a rapid and irregular action of the heart. These symptoms were measurably relieved by an opiate, and on the following day the signs of pleurisy with pneumothorax affecting the right side again appeared. There was still dyspnœa with rapid breathing, and symptomatic fever. From this date to the last of February, 1874, the symptoms were noted almost daily, embracing pulse, temperature, etc., and at short intervals also the physical signs. In a short time he began again to expectorate pus, and there was a considerable accumulation of liquid within the pleural sac. In November he passed under the care of Prof. Loomis. On the 26th of December a free opening was again made near the site of that formerly made, and 36 ounces of inodorous pus were discharged. The aperture was kept open, and the injections employed as before. On the 28th of July, there was a discharge of about two ounces of pus daily from the opening; the patient was feeble, keeping the bed; the pulse varied from 92 to 120, the respirations from 24 to 30 per minute, and the axillary temperature fluctuated between 99° and 102½°.[1]

Case 2. Gaspar De C., aged 46, Italian, gardener, was admitted into Bellevue Hospital, April 26, 1873. His illness commenced about five months before his admission, and the symptoms at first denoted subacute pleurisy. He had kept the bed for nearly a month before his admission. He had very little cough and expectoration. The signs, on his admission, denoted pleurisy, with considerable effusion. May 27, twenty-three ounces of serous liquid were withdrawn by means of Dieulafoy's aspirator, under the direction of Professor Loomis. May 17, twenty-six ounces of serous liquid were withdrawn by means of the same instrument. The signs characteristic of pneumo-hydrothorax were first noted July 5. The patient came under my charge July 1. Prior to this date the results of repeated explorations were noted, and they showed only simple pleurisy. July 15, he expectorated muco-pus in great abundance. July 18, exploration of the chest by means of a hypodermic syringe showed that the pleural cavity contained pus. July 19, a free incision into the chest was made by Professor Gouley, and eighty-two ounces of fetid pus were discharged. The opening was maintained, and injections of tepid water, with the addition of a little carbolic acid, were employed daily. At this time the patient was quite feeble, for the most part keeping the bed, the pulse varying from 92 to 102 per minute, and the axillary temperature fluctuating between 99° and 101½°. He progressively improved, gaining in weight and strength. September 15, he was able to be up all day, and out of doors. At the end of my service, on March 1, there was still a discharge of about two ounces of pus daily, sometimes fetid, and sometimes inodorous. He continued to hold his own as regards weight and strength. The record, which is quite full, contains no account of cough or expectoration.[1]

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[1] This patient subsequently died. The post-mortem examination showed that phthisis did not exist.

The value of these two cases as illustrative of the usefulness of thoracentesis, with a free opening, maintained as long as a purulent discharge continues, in cases of perforation of lung when consecutive to empyema, is not invalidated by the fact that a permanent recovery cannot be reported. In both cases the condition of the patients when the free opening was made seemed quite hopeless. More especially, in the first case, the prognosis appeared almost as unfavorable as possible. In the space of a few weeks this patient was restored from impending death to full health. This result is most striking, albeit perforation of the lung was renewed and followed by pleurisy, with pneumothorax, from which the patient did not recover. To repeat the objective point in citing these cases, may not similar benefit be obtained by the same procedure in some of the cases in which perforation of the lung and pneumo-hydrothorax are incident to tuberculous disease? This question can only be satisfactorily answered by clinical facts; and these facts will be obtained if the practice be adopted of making a free and permanent opening into the chest in such cases, as a measure for palliation of dyspnœa and the prolongation of life. Certainly this practice is, to say the least, warrantable in view of the almost invariably fatal termination in these cases when thoracentesis is not employed.

The date of the occurrence of perforation in phthisis, reckoning from the commencement of the phthisical affection, varies in different cases within wide limits. Considering generally the beginning of persistent cough as representing the commencement of the phthisical affection, the longest period was "several years," the precise number not having been noted; and the shortest period was alike indefinitely noted as "recently." In 2 cases the period was noted as "several years;" in 2 cases it was a year; in 2 cases it was six months; in 1 case it was three months; and in 1 case cough had existed for only ten days; but, in this case, the patient had been ill for several months, although there had been no cough. Dating from the cough, this was, in fact, the shortest period.

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[1] The notes of these two cases were made under the direction of the house physician, Dr. James L. Perry.

The duration of life after the occurrence of perforation is also variable. In 3 cases this period is noted as "soon afterward;" it was two months in 1 case; six weeks in 1 case; a month in 1 case; seventeen days in 1 case; fourteen days in 1 case; five days in 1 case; and four days in 1 case.

Pulmonary Calculi.

In the following case, calculi were expectorated in larger quantity than in any other of the cases under analysis:—

Mr. S., farmer, aged 40, consulted me in June, 1843. He had had some acute affection of the chest in January, 1843. Prior to this date, for many months he had had a slight hacking cough. Soon after the acute affection he began to raise calcareous concretions, and he had continued to do so, with intervals of a few weeks, up to the time of his consulting me. He had with him a pill box filled with calculi, some of which were of nearly the size of small peas. He had distributed them in considerable quantities among the physicians in his neigborhood. Before expectorating them he had paroxysms of severe cough, and afterward he raised some bloody mucus. In the intervals, his cough was slight and attended with very little expectoration. He presented a healthy aspect. He had had no medical treatment since January, but had lived as usual, taking spirits moderately. I discovered no physical signs save feebleness of the respiratory murmur, but at that time I had had comparatively little experience in physical exploration. In July, 1856, Mr. S. again called upon me. He was then in perfect health. After his former visit, thirteen years before, he continued from time to time to expectorate calculi, but at length there was no cough nor expectoration of any kind.

It should be added that the calculi, in this case, had the characters of calcareous concretions as distinguished from the solid masses which are not infrequently formed in the follicles of the tonsils, that is, they were dry, hard, and crumbled under pressure, instead of being sebaceous and yielding to pressure without crumbling. They were not chemically analyzed.

In the following case the number of calculi expectorated was much less. Dr. K. from Canada, aged 23, consulted me in February, 1858. Cough had existed for two years. It was at first dry, and afterward it was accompanied by a thin frothy expectoration. He had lost weight which in a measure he had regained. His aspect was not morbid. I have simply noted that he had expectorated a few small calculi. There was dulness on percussion at the left summit in front and behind, with a broncho-vesicular and wavy respiration. In August of the same year, I noted that he went to a southern climate, and that he had improved, although the cough persisted. There is no further record.

In both these cases the histories are consistent with the doctrine which holds pulmonary calculi to be obsolete tubercles, and that their significance is favorable as denoting retrogression of the tuberculous affection.

Pneumorrhagia and Gangrene.

The infrequency of pneumorrhagia (pulmonary apoplexy), and of gangrene of the lung, in connection with phthisis, is evidenced by the fact that in this collection of cases I find but a single example of each of these events. Some account of the case of pneumorrhagia has been already given in Chapter I. (*Vide* page 39.) The following are the important facts noted in the history of this case. A colored woman, aged 35, came under my observation in May, 1845, and I noted at that time that there was phthisis with cavities at the summit of the left lung. May 31, she had a quarrel with her husband and left his house. June 1, she was seized with hæmoptysis which was repeated on June 2. The amount of blood raised was large. Death took place June 2. She had no medical attendance after the occurrence of the hæmoptysis. After her death the story became current that she died from injuries inflicted by her husband, and a post-mortem examination was made under the direction of a coroner. At the summit of the left lung was a cavity of the size of an English walnut and several small cavities. The upper lobe was extensively solidified by exudation. The lower lobe contained numerous gray granulations, together with nodules and small cavities. In the upper lobe was an apoplectic nodule of the size of an English walnut together with several similar nodules of smaller size. The right lung contained nodules of exudation and some small cavities. In the middle and lower lobe the parenchyma was extensively infiltrated with blood. There was fluid blood in the large bronchial tubes on this side. Unfortunately the condition of the heart, as well as of other organs, was not noted.

The great infrequency of pneumorrhagia, considered in connection with the great frequency of bronchorrhagia, in cases of phthisis, shows that if the former be ever a consequence of the latter, the instances must be extremely rare. If there were much liability of blood effused from the bronchial mucous membrane to be drawn backward into the air cells by the force of inspiration, it would reasonably be expected that the occurrence of hæmoptysis in cases of phthisis would give rise to numerous examples. It is perhaps questionable whether pulmonary apoplexy is ever produced in this way. In the case just cited, the organs were not examined with sufficient minuteness with reference to the source of the pneumorrhagia. This question, however, arises: If the blood which infiltrated the air cells were inhaled, should not tuberculous cavities have contained blood; in other words, would not the force of the inspiration carry the blood into the cavities, more readily than into the air cells? It would be out of place here to discuss the mechanism of pneumorrhagia; the chief point of interest pertaining to the clinical study of this event, is its great infrequency in cases of phthisis, and the conclusion deducible therefrom that it is very rarely, if ever, dependent on bronchorrhagia.

The case of gangrene of the lung came under my observation in November, 1859. The patient, a man of middle age, was in the Charity Hospital, New Orleans, in the service of my colleague, the late Dr. Fenner. I saw him, with Dr. Fenner, the day before his death. I made no note of the history, except that he had hæmoptysis and a fetid expectoration. To recapitulate the appearances after death, there was an old cavity at the apex of the right lung, with ridges and a broken band of condensed tissue of the size of a pipe-stem. Connected with this cavity was a mass of gangrenous lung in process of sloughing. There were no tubercles nor appearances of inflammation. At the anterior aspect of the lower lobe of the left lung within a space of the size of an orange, the tissues were friable, and a portion of the size of a filbert was broken down. It emitted a gangrenous odor. The surrounding lung was free from tubercles, and from any appearance of inflammation.

In this case there was no evidence of any recent phthisical affection, and it may be doubted if the gangrene had any pathological connection with the phthisis; that is, the occurrence of the gangrenous affection in a person with an old tuberculous cavity, may have been merely a coincidence. At all events, gangrene of lung is among the very rarest of rare events occurring in connection with phthisis.

Dorso-intercostal Neuralgia.

In some cases this intercurrent affection was noted. It is not of very infrequent occurrence in cases of phthisis; and it is to be discriminated from other conditions which occasion pain in the chest. One of these is the traction of the lower ribs, which is caused by violent or frequently recurring cough. The pain thus produced is dull or aching, and is referred to both sides of the chest. The other condition is pleurisy either dry or attended with effusion. Pleurisy with effusion is, of course, easily recognized by obvious physical signs. The repeated attacks of dry pleurisy may be accompanied by a pleural friction murmur, but this is not always appreciable. The pain is usually referred to the summit of the chest in front or beneath the scapula. But the diagnostic characters belonging to dorso-intercostal neuralgia are sufficiently distinctive, namely, tenderness in isolated, circumscribed points anteriorly near the sternum, laterally in the intercostal spaces, and posteriorly by the side of the spinous vertebral processes. In the great majority of cases, but not invariably, the neuralgic affection is situated on the left side.

Latency of Phthisis and the Sudden Evacuation of Collections of Liquefied Morbid Products or "Tuberculous Abscesses."

Under this caption I shall introduce an account of a case illustrating latency, as regards pulmonary symptoms, prior to the occurrence of copious puruloid expectoration.

Mr. W., aged 22, was seen by me in consultation in March, 1847. He had been ill four or five weeks, but without any cough. He complained chiefly of general debility. He was able to sit up but a few hours daily. The pulse varied from 80 to 100. His appetite was fair, and there was no evidence of disturbed digestion. He had some stitch pains in the right side of the chest. The respirations were accelerated, and he had want of breath on exercise. There was dulness on percussion at the summit of the chest on the left side in front, and on the right side behind. The day following my visit he was seized, while laughing, with a paroxysm of cough, and he shortly began to expectorate. He raised a considerable quantity of purulent looking liquid. Shortly afterward cavernous respiration was discoverable in the left infra-clavicular region. Death took place in the spring of 1848, preceded by the symptoms and signs of phthisis. There was no post-mortem examination.

Affection of the Heart and Pericardium.

In no case was pericarditis known to exist exclusive of the four fatal cases in which the morbid appearances denoting this affection were found on post-mortem examination. (*Vide* Chap. I. page 43). This statement shows the infrequency of pericarditis in cases of phthisis. Moreover, it is worthy of notice that, of these four cases, in three, pleurisy existed with effusion, proceeding in two of these three cases from perforation of lung, and in one of the three cases there was disease of the kidneys. These facts render still more striking the infrequency of pericarditis, as connected directly with phthisis. The inference is, that in most of the rare instances of pericarditis in cases of phthisis, either pleurisy with effusion or renal disease coexists, these latter affections standing probably in a causative relation to the inflammation of the pericardium. We might reasonably expect that rheumatic pericarditis would occur in cases of phthisis; but, as will be presently seen, patients with phthisis are very rarely affected with acute articular rheumatism, and hence I have not, in this collection of cases, a single instance of pericarditis associated with the latter affection.

Of affections of the heart, I find two cases, exclusive of the ten fatal cases of which an account is given in Chapter I. (page 42). I give abridged histories of these two cases.

Case 1. Bridget M., aged 20, domestic, was admitted into hospital May 19th, 1862. Cough had existed for six years. She had had want of breath on exercise as long as she could remember. She had never had rheumatism. She had kept at work up to a week before her admission. The signs noted were vesiculo-tympanitic resonance on percussion of the left summit in front, and dulness behind; the respiratory murmur in front obscured by rales, and over the scapula broncho-vesicular respiration. An aortic direct and an aortic regurgitant murmur existed, and the heart was moderately enlarged. She soon left the hospital improved sufficiently to return to work. Four years afterwards she came to my clinic, and stated that during most of this period she had kept at work. She came to be treated for intermittent fever. She was notably anæmic. In addition to the aortic murmur just named, a mitral regurgitant murmur was discovered. The apex-beat of the heart was in the fifth intercostal space on the linea mammalis. The cough and expectoration were slight. After a month she felt able again to resume work.

The phthisical affection in this case was small, and evidently, for at least four years, it was non-progressive. That this disease existed I cannot doubt, although the diagnostic evidence in the history would have been more complete had vocal signs been noted. Assuming its existence, whatever influence the cardiac affection may have exerted upon it must have been to prevent its progress.

Case 2. John M., aged 64, presented himself at my clinic, May 30th, 1866. Cough, with small expectoration, had existed for two years. He was considerably under his standard weight of health. He had repeatedly had attacks of articular rheumatism. The following signs were noted: Marked dulness on percussion at the right summit, with feeble broncho-vesicular respiration and moist rales. The apex-beat of the heart was in the sixth intercostal space, half an inch without the linea mammalis. There were three cardiac murmurs, namely, aortic direct, aortic regurgitant, and mitral regurgitant. The arteries of the neck and the brachial arteries pulsated strongly. No further record of the case.

It will be observed that in this case phthisis, although dating from the commencement of cough, had already existed two years, was moderate in amount, and apparently not actively progressing.

Articular Rheumatism.

The analysis with respect to antecedent diseases gave only three cases in which patients were subject to attacks of rheumatism, and the tuberculous disease immediately followed an attack in but a single case. (*Vide* Chapter II., page 66.) It is therefore evident, in view of the frequency of this affection during the term of life in which phthisis is most apt to be developed, that the constitutional tendency to rheumatism or the rheumatic diathesis does not render persons more likely to become phthisical, but, on the other hand, if this diathesis have any influence it is antagonistic to phthisis. An antagonism is further rendered probable by the infrequency of rheumatism in patients who are affected with phthisis. I find among my cases only one instance of rheumatism as an intercurrent affection. In this instance the rheumatism occurred when the tuberculous disease was non-progressive. The following is a synopsis of the history: Mr. W., aged 30, planter, residing in a swampy situation in Mississippi, consulted me February 12th, 1860. He had had cough with small expectoration since the preceding autumn. He had been subject during previous winters to cough, which disappeared during the summer. He had never had hæmoptysis. He was not much, if at all, under his healthy standard of weight. There was slight dulness on percussion at the left summit of the chest, with deficient superior costal movement, notable feebleness of the respiratory murmur, crumpling rales, increase of vocal resonance and of whisper. In a letter dated March 11th, 1860, this patient informed me that he was then recovering from an attack of inflammatory rheumatism. His cough was very slight. In February, 1861, I received a message from him that he was in good health.

Disease of the Kidneys.

In Chapter I., page 46, are stated the results of an analysis of thirteen cases, with reference to the appearances found in the kidneys on post-mortem examination. Of the thirteen cases there were morbid appearances in these organs in seven. It would be unfair to draw from these data any conclusion respecting the ratio of cases of phthisis in which the kidneys are diseased, for the great majority of the histories which embrace autopsies do not contain any account of examinations of these organs. They were doubtless examined or the appearances noted chiefly when there had been symptoms pointing to renal disease. Doubtless in a certain proportion of the cases, the histories of which lack an account of the kidneys, and of the cases in which post-mortem examinations were not made, these organs were more or less diseased; but it is not reasonable to suppose in the ratio of seven to thirteen. Of the seven cases in which the kidneys were found to be diseased, in three they were affected with tuberculous disease; in two they had the appearances of the large white kidneys; in one case they were waxy, and in one case fatty. It will be of interest to refer to the histories of these seven cases, in order to see if they contain events symptomatic of renal disease. The facts with regard to this point of inquiry in the cases severally, briefly stated, are as follows:—

Of the three cases in which the kidneys were tuberculous, in one case there was pleurisy with effusion when the patient came under my observation; and after thoracentesis the signs denoting perforation of lung were present. The autopsy showed pericarditis and peritonitis. There is no account of general dropsy, nor of uræmic phenomena referable to the nervous system. In another of these two cases, general dropsy and uræmic phenomena referable to the nervous system were wanting. The pia mater and brain, the liver, and the spleen contained tubercles, and there were intestinal ulcerations. The lungs in this case were crammed with miliary tubercles, without cavities or cheesy exudation. The patient was delivered of a five-months' fœtus shortly before death. This case was one of acute tuberculosis. In the third case death took place on the fourth day after perforation of lung followed by pneumo-hydrothorax. The lower limbs were œdematous. The urine contained albumen, with granular and hyaline tube-casts. The liver was fatty.

In the case in which the kidneys were noted as waxy, the liver and spleen were in the same condition. Dropsy and uræmic phenomena do not appear in the history. The patient had had syphilis. He had loss of voice for a long time before death, and there was erosion of the superior vocal chords. Ulcerations existed in the ileum and cæcum. The tuberculous affection of the lungs was small, and the left lung was solidified and contracted from interstitial pneumonia.

In the case in which the kidneys were fatty, the liver was in the same condition. Profuse intestinal hemorrhage was the immediate cause of death in this case. The large and the small intestine contained numerous ulcerations. There was peritonitis. The tuberculous affection of the lungs was not large.

Of the two cases in which the appearances were those of the "large white kidney," in one case it is simply noted that the patient entered hospital with Bright's disease. The physical signs showed a very small pulmonary affection, and a single nodule only was found after death. The patient was employed in the apothecary's department of the hospital, and died from taking a dose of aconite from a vessel which he supposed contained spirit. In the second case the urine was albuminous, and contained tube-casts. There is no note of general dropsy, and the mode of dying was by asthenia. The pulmonary affection was small, and the left lung was much condensed and contracted from interstitial pneumonia.

This inference may be drawn from the foregoing few cases, to wit, renal disease may exist in connection with phthisis without general dropsy, or any of the uræmic phenomena referable to the nervous system, the more marked of the latter being coma and convulsions.

I pass now to study those cases in which events symptomatic of disease of the kidneys are contained in the histories. I find only three cases in which these events are noted. This small number of cases shows disease of the kidneys giving rise to general dropsy and uræmic coma and convulsions to be extremely rare in connection with phthisis. I shall introduce a condensed account of these three cases severally.

Case 1. Mrs. P., aged 45, consulted me in December, 1863.

Cough had existed since the preceding March. The signs showed a considerable affection at the summit of the right lung. In May, 1864, cavernous signs were present, with so much diminution of volume of the right lung that the heart had been drawn to the right side of the sternum. In January, 1865, she again consulted me. She was extremely feeble, but occasionally rode out. I saw her again in consultation in January, 1866. She was then in a state of coma, which was considered as uræmic coma, and she died in that state. An examination of the urine gave evidence of disease of the kidneys, but I failed to note the appearances. No post-mortem examination.

Case 2. Frank B. R., aged 22, consulted me in August, 1867. Cough had existed for three months. The signs showed a moderate affection at the summit of the left lung. Huskiness of voice existed. January 18, 1868, there was no material change. September 5, 1868, bronchophony and cracked-metal resonance on percussion existed at the left summit. December 17, 1869, it is noted that within a few weeks general dropsy had occurred, and the urine contained albumen, together with waxy casts. April 15, 1870, the dropsy continued, and the patient was quite feeble. Death took place July 4, 1870, preceded by uræmic convulsions. No post-mortem examination.

Case 3. Maurice S., aged 52, admitted into hospital December, 1857. Cough had existed for from two to three years. The signs showed a moderate affection at the summit of the left lung. The fingers were bulbous. In May following this patient had pneumonia, affecting successively the lower and the upper lobe of the left lung. Delirium was marked. He became anasarcous, and the urine was loaded with albumen. Death took place May 22, the delirium continuing until death. No post-mortem examination.

The presence of albumen in the urine is noted in several of the histories which, aside from this symptom, contain no symptomatic events referable to disease of the kidneys.

In the foregoing three cases the symptomatic events representing disease of the kidneys were manifested after the development of phthisis. If there existed any relation of cause and effect between the renal disease and the tuberculous affection of the lungs, the latter was causative. As regards the inquiry whether disease of the kidneys may not stand in a causative relation to phthisis, I refer to the fact that, in Chapter II., among the different diseases which were noted as an antecedent to the pulmonary affection, renal disease does not enter. With reference to this point of inquiry, I may refer to an analysis of 102 recorded cases of Bright's disease which I made in 1870.[1] The facts elicited by this analysis showed no tendency in Bright's disease toward phthisis.

Thrombosis of the Iliac Veins.

In one of the fatal cases examined after death, obstruction from thrombosis existed in both iliac veins (*vide* Chapter I., page 46). In this case œdema of the lower limbs and of the scrotum was marked, without anasarca. Œdema, confined to these parts, was marked in another case in which there was no post-mortem examination. Thrombosis of the iliac veins is to be inferred whenever œdema of the lower limbs exists without general dropsy, and exists to an extent not attributable to mere feebleness of the circulation.

Angular Curvature of the Spine.

In two cases, angular curvature of the spine occurred after the occurrence of symptoms denoting the existence of phthisis. The histories condensed are as follows:—

Case 1. John R., aged 17, laborer, was admitted into hospital in November, 1856. Cough had existed for two years, and he had had several attacks of hæmoptysis, the last attack having been fifteen months prior to his admission. Pain in the back had existed for a year, and had progressively increased in intensity. The cough was now slight. There was dulness on percussion at the summit of the chest on the right side in front and behind, with broncho-vesicular respiration. An angular curvature of the spine existed at the second lumbar vertebra. The pain was referred to this situation, and there was much tenderness here on pressure. In March, 1857, it was noted that the angular curvature had increased. The cough and expectoration were slight, and the patient was able to be up and out of doors. In April the condition of the patient had improved, and he left the hospital. He was readmitted in May, 1858. His weight and strength had diminished since he left the hospital. The spinal curvature had increased. He still complained of pain in the back. There was no paralysis. The appetite and digestion were good. In September, 1858, he was still in hospital. There was no material change in his condition. He was able to be up all day and to go out of doors. My service ended on that date, and there is no further record of the case.

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[1] *Vide* Bellevue and Charity Hospital Reports, 1870.

Case 2. Richard H. B., aged 21, surveyor, was admitted into hospital in January, 1860. Cough had existed since August, 1859. At the time of the commencement of cough he had tertian intermittent fever, which was arrested by quinia. He had hæmoptysis shortly after the commencement of cough. He began to suffer from pain in the back in December, 1859. This pain had continued and increased up to his admission into hospital. On his admission he was quite weak, his aspect was pallid, and he had but little appetite. The pain in the back was a prominent symptom. There was an angular curvature at the last dorsal vertebra, with much tenderness on pressure in this situation. There was dulness on percussion with broncho-vesicular respiration at the summit of the chest on the left side. He began to improve shortly after his admission, and in a little over two months he was much stronger and had gained ten pounds in weight. The cough had greatly diminished, and the expectoration was quite small. He had now no pain in the back nor tenderness on pressure; and the curvature gave him no inconvenience except when he maintained for some time a stooping posture. In March, 1860, when my term of service ended, I left him employed as a ward nurse, performing the duties actively and reporting quite well. In March, 1861, I met this patient in the street, looking perfectly well, and he told me that his health was very good.

The small amount of the pulmonary affection of the lungs in both these cases, the non-progression of this affection in the first case, the arrest and recovery in the second case, from both the pulmonary and the spinal affection, are the noteworthy points in the histories.

Cerebral Meningitis.

My collection of cases does not embrace children affected with tuberculous disease. After childhood, cerebral meningitis is extremely rare in cases of Phthisis. I find but a single case in which the symptoms denoted this complication. In a case already introduced (*vide* page 47) in which tubercles were found in the pia mater after death, the symptoms of meningitis were not present. I subjoin an account of the case in which symptoms having that significance were noted.

Patrick W., aged 26, laborer, was admitted into hospital in January, 1859. He stated that he had never had syphilis, and that prior to his present illness, he had always been well, excepting that five years before his admission he had an ulcer on his leg which lasted a year. Cough had existed for eighteen months. He had had hæmoptysis once. He had kept about up to his entering the hospital, but soon afterward he took to the bed; he lost weight rapidly; hectic paroxysms supervened, and the fingers became bulbous. The signs showed a considerable amount of disease at the summit of the chest on the right side. In April, 1859, intense pain in the head, accompanied by vomiting, was followed by somnolency, double vision, slowness of the pulse, and death was preceded by coma. There was no post-mortem examination.

Perineal Fistula.

An important question relating to perineal fistula in cases of phthisis is this: What significance or influence has this event as regards the progress of the disease? Hanging on this question is another of practical importance, namely, Is it advisable to attempt the cure of the fistula by surgical interference? The existence of fistula is noted in the histories of thirteen cases. I shall give the histories, generally, in so far as the facts which are noted bear upon the foregoing questions:—

Case 1. Elisha H., aged about 40, came under my observation in April, 1846. Eighteen years previously he had had all the symptoms of phthisis and had recovered. The morbid appearances which were in relation to this illness are given in Chapter I., page 27. In July, 1845, he had perineal abscess resulting in fistula. An attempt to cure the fistula by incision was made, and it was in a great measure, but not entirely, successful. In April, 1846, he had repeated attacks of profuse hæmoptysis accompanied with cough. Death took place June 12, 1846, and the autopsy showed cheesy exudation which in some situations had undergone softening, with miliary tubercles in abundance.

Case 2. Henry F. H., aged 35, accountant, consulted me in April, 1856. Both parents, together with several of his brothers and sisters, had died with consumption. He had what was called "white swelling" of the knee when he was eleven years old. At twenty years of age he had hæmoptysis not followed by cough. When twenty-five years of age he had an acute affection called "lung fever." Four years before consulting me, he had repeated attacks of hæmoptysis without persistent cough. This latter symptom had existed for about six months, and he now had considerable expectoration, with want of breath on exercise. He had lost weight shortly after the cough commenced, but of late he had gained in this respect. The physical signs showed a considerable affection at the right side of the chest. Perineal fistula had existed for five years. In August, 1856, he had progressively gained in weight, and his appearance was healthy. He had been constantly engaged in his occupation, and had taken no remedies. He was anxious to have the fistula cured, but he was advised againt any measures for that end. November 14, 1856, it was noted that he continued as well as in the preceding August. No further record of the case.

Case 3. Mr. K., agent and speculator, aged 25, was examined by me in 1850, with a negative result as regards the signs of pulmonary disease. An examination in September, 1855, gave the signs of a small phthisical affection. He had hæmoptysis in that month, and from this date he had persistent cough. In August, 1856, the signs still denoted a small amount of disease. He consulted me next in October, 1862. The signs then showed an increase of the pulmonary affection. He was actively engaged in business. In March, 1866, he had perineal abscess which ended in a fistula. At this time he had profuse hæmoptysis which recurred for several successive days. Death took place in January, 1869. Meanwhile, the perineal fistula had healed spontaneously. He progressively failed in strength, and suffered from want of breath on exercise, but he persisted in his business, and did not desist until the day of his death.

Case 4. Mr. W., aged 31, clerk, had a slight attack of hæmoptysis, with cough, in 1850, and about the same time perineal fistula. He then resided in Boston, and was treated by Prof. J. B. S. Jackson. After a time, his cough having ceased and his general condition improved, the fistula was divided by Prof. Parkman. The healing was slow, but the operation effected a cure. He then went to live at the South, and he consulted me in New Orleans, in December, 1860. About two months before this date, just after returning from a visit in New England, he began to cough, and the cough had persisted, accompanied with considerable expectoration. The signs showed a small affection at the summit of the chest on the left side. No further record of the case.

Case 5. Mr. D., planter in Mississippi, aged 34, consulted me in March, 1861. In April, 1860, he had repeated attacks of hæmoptysis, and cough had since persisted. He was not much emaciated, and his aspect was not notably morbid. A small perineal fistula had existed for several weeks. His voice was slightly husky. The signs showed a considerable affection at the summit of the chest on the right side. No further record of the case.

Case 6. A male patient presented himself at my college clinic in June, 1861, aged 30, machinist, and stated that cough had existed for two years. His family were predisposed to phthisis. He was considerably emaciated and feeble. A perineal fistula had existed for six months. The fistula was treated by incision in the preceding month, with partial success. He had lost ground notably since that month, having had more cough and expectoration, with more rapidly progressive loss of weight and of strength than at any previous equal period. The signs denoted a moderate affection. No further record of the case.

Case 7. Mr. S., aged 56, merchant, consulted me in May, 1867. His father died with phthisis. Ten years before consulting me, he had repeated attacks of hæmoptysis. He had cough at this time and his general health was bad. He went to New Orleans and recovered. He had now had for several months a dry cough, and recently a considerable hæmoptysis had occurred. A perineal fistula had existed for several years. An attempt had been made to cure it by incision, but without success. He had not lost much in weight, and his aspect was healthy. The physical signs showed a moderate affection at the summit of the chest on the right side. He went to Europe, and on his return in September, 1867, he was much improved; but he had still a troublesome cough. In September, 1869, a physical exploration showed no increase of the pulmonary affection. His voice was husky. He shortly afterward went to California, and died in March, 1870.

Case 8. Mr. C., farmer, aged 35, had repeated attacks of hæmoptysis, without persistent cough, five years before he consulted me in August, 1864. Shortly after these attacks of hæmoptysis he had perineal fistula, which was treated successfully by incision. An issue was made in the arm, and kept open for a year. He then resided in New York City. He left the city and became a farmer. His health after this was good up to a few weeks before consulting me; then he began to cough. There had not been much loss in weight or strength. The signs showed solidification at the base of the left lung, and obstruction of the left primary bronchus. In August, 1865, there was some diminution of the solidification at the base of the left lung, the obstruction of the bronchus persisting, and he had held his own as regards weight and strength. In July, 1867, there were cavernous signs near the summit of the chest on the left side. He had recently had an attack of cholera morbus, and after this attack he failed rapidly. His death took place soon afterward in Minnesota.

Case 9. Mr. S., aged 51, consulted me in November, 1869. A year prior to this date he had an attack of hæmoptysis, and cough had persisted afterward. In the winter of 1868–69 he had perineal abscess resulting in fistula. This had recently healed spontaneously. He had lost but little in weight. The signs showed a moderate affection at the summit of the chest on the right side. In April, 1870, he had lost in weight and strength, and the signs showed an increase of the tuberculous affection. Death took place during the following winter.

Case 10. Jacob B., stonecutter, aged 48, was admitted into hospital February 6, 1854. Cough had existed for nine months, and he had ceased to work for four months. Perineal fistula had existed for four months, during most of which period he had kept the bed, chiefly with a view to the healing of the fistula. The cough and expectoration were slight. The signs showed a considerable affection at the right summit of the chest. He left the hospital on the 16th of February, and there is no further record of the case.

Case 11. Alexander H., aged 24, machinist, was admitted into hospital August 18th, 1856. He had had repeated attacks of hæmoptysis, but was able to work up to the time of his admission. He entered the hospital on account of a perineal fistula which had existed for four weeks. The signs showed a small affection at the summit of the chest, on the left side. Being advised against an operation for the cure of the fistula, he left the hospital September 1, 1856.

Case 12. Martin Q., aged 33, colored, seaman, was admitted into hospital November 28, 1857. Cough had existed since March, 1853. He had had numerous attacks of hæmoptysis. A year before his admission he had perineal abscess resulting in fistula. The cough became less after the occurrence of the fistula, and the attacks of hæmoptysis were not as frequent. There were two fistulous openings from which there was a considerable purulent discharge. His aspect was not morbid, and he was not much emaciated. It is simply noted with respect to the physical signs that they showed unequivocally phthisis. In February, 1858, the condition of the patient was improved, and there is no further record of the case.

Case 13. The details of this case will be given more fully in the next chapter among the cases ending in recovery (No. 33). Phthisis was developed in the summer of 1859. In the winter of 1859–60 he was considered to be in a hopeless condition. Perineal abscess, resulting in a blind fistula, occurred in the following spring. The patient, a distinguished member of the medical profession, dated his improvement from this event. He progressively improved during the summer of 1861 and the following winter, and he is now well (1874). Quoting his language, "My opinion has been that the most conservative remedy in my case Providence kindly gave me in the form of a fistula."

It is noteworthy that in all the thirteen cases the patients were of the male sex.

Of the thirteen cases, in seven the histories are incomplete, and therefore these cases are of less value with reference to the question as to the significance or influence of perineal fistula in the progress of phthisis. In one case recovery from phthisis took place. This case, and the remaining five cases ending fatally, may furnish some information with reference to this question. In one of the five fatal cases (No. 1) the fistula preceded the persistent cough, which, with hæmoptysis, denoted the development of the pulmonary affection; and the patient was in a great measure, but not completely, cured of the fistula by incision. The pulmonary symptoms began several months after the operation (the precise time is not noted), and the duration of life from the time of their occurrence was about two months.

In another case, No. 8, the fistula was cured by incision. In this case the fistula preceded persistent cough, but it occurred shortly after an attack of hæmoptysis. The patient, immediately after the hæmoptysis, removed from the city to a farm in the country, and an issue in the arm was kept open for a year. He had good health for five years afterwards, before the symptoms and signs of phthisis were present. Dating from the occurrence of cough, the duration was over four years.

In another case, No. 7, a cure was attempted by incision, but the operation was unsuccessful. The fistula preceded the manifestations of the pulmonary affection in this case. It existed for five years, and the duration of the phthisis was four years.

In two cases, Nos. 3 and 9, the fistula healed without surgical interference. The duration of the phthisis in one of these cases was fourteen years, and the fistula occurred three years before death. In the other case the fistula occurred soon after the commencement of pulmonary symptoms, and it continued for nearly a year. Death took place about a year afterward. The pulmonary affection progressed after the spontaneous cure of the fistula, and there was progressive failure in strength, etc.; whereas, prior to the cure, he was in fair general health, and the signs showed a small amount of tuberculous disease of the lungs.

These five cases, it is needless to say, are too few to serve as the basis of positive conclusions; but, so far as they afford information, perineal fistula is a favorable event in cases of phthisis. We may consider these few cases as giving some support to the opinion that this event either occasions or betokens slowness in the progress of the pulmonary affection; and these cases do not afford ground for the advisability of endeavoring to effect a cure of the fistula.

Of the seven cases, the histories of which are incomplete, slowness of progress and tolerance are exemplified in cases Nos. 2, 11, and 12, and there was improvement after the occurrence of the fistula in No. 12. In No. 6 a partial cure was effected, and the subsequent progress of the disease was rapid. A cure had been effected in No. 4 of a fistula which had occurred in connection with symptoms denoting phthisis. But, in this case, the cure was effected after recovery from the tuberculous affection, and the patient made a permanent change of climate from that of New England to the Southern States. The pulmonary affection returned ten years afterward. In Cases 5 and 10, although the pulmonary affection was considerable, the local and general symptoms did not denote active progress of the phthisis. The study of these seven cases serves to corroborate the information derived from the five fatal cases respecting the significance or influence of perineal fistula in cases of phthisis. As regards the import of this event in prognosis, it would seem to be like that of chronic laryngitis when this affection does not interfere with alimentation.

In only one of the thirteen cases (No. 13) was recovery from the phthisis known to have occurred. This case is of much interest in connection with the question raised respecting fistula. The improvement, at a time when the condition of the patient seemed discouraging, followed the occurrence of the perineal abscess; and the patient, a distinguished medical practitioner and teacher, ascribed the improvement to this event.

In a case observed since the abstracts of the cases in this collection were made, perineal fistula occurred several months after recovery from phthisis, the fistula being unaccompanied by any return of the pulmonary symptoms and the general health good. The patient consulted me with reference to the propriety of an operation for the cure of the fistula, and non-interference was advised.

Pregnancy.

Pregnancy, as involved in the Etiology of Phthisis, has been already considered. (*Vide* Chapter II., page 67) I shall now study the cases in which patients already affected with phthisis became pregnant. Pregnancy in phthisical patients is by no means common, yet I find in my collection nine cases, in all of which save two cases it was evident that event was consecutive to the pulmonary affection. In the two excepted cases there is ground for doubt as to the pregnancy being consecutive. The important question relating to this topic is, what influence has pregnancy on the progress of phthisis? I shall give a succinct account of the eight cases severally.

Case 1. Mrs. S. was seen by me in consultation, in February, 1849. Cough had existed for three years. In the mean time she had given birth to two children, the last having died when a few months old. She had gained in weight and strength after weaning which was advised on account of her general debility. Chronic laryngitis had existed for several months. She had kept the house for three months. The physical signs were dulness on percussion at the left summit of the chest and broncho-cavernous respiration. She passed the winter of 1849–50 at the South, and died in April, 1850.

Case 2. Mrs. M., aged 21, teacher, consulted me in August, 1863. About two and a half years prior to this date, she had some acute affection of the chest, and kept her bed for two months. She had not been free from cough since that illness. During the winter of 1862–63 she had three attacks of profuse hæmoptysis, and she had raised a little blood repeatedly. Her aspect was healthy, the prolabia having good color. The menses were regular. The physical signs were, dulness on percussion at the left summit of the chest in front and behind, feebleness of the respiratory murmur in that situation, with subcrepitant rales and undue transmission of the heart-sounds. This patient shortly afterward married. She soon became pregnant, miscarried, with twins, in the latter part of gestation, and eighteen months afterward died with phthisis.

Case 3. Mrs. C., aged 38, consulted me in August, 1863. Cough had existed for twelve years, and for several years she had had want of breath on any exertion. She had had eight children, the youngest being now 14 months old. One was premature and died shortly after birth; the others were large and healthy. She had nursed all her children, the last, however, but for only a short time, owing to failure of the secretion of milk. In the autumn of 1862 she had an acute affection which was considered to be pneumonia. Since that time she had had three attacks of hæmoptysis. The physical signs were marked dulness on percussion at the summit of the chest on the right side, broncho-vesicular respiration, bronchophony, and bronchophonic whisper, with moist rales. The patient stated that she was always better as regards cough and expectoration when pregnant. It is supposed that in this case phthisis existed prior to the occurrence of the pneumonia; there is, however, room for doubt respecting this assumption.

Case 4. Mrs. A., aged about 25, consulted me in August, 1867. Cough had existed for a considerable period, the precise duration not having been noted. Her aspect was not morbid. The menses had not appeared since the birth of a child now two and a half years old. There was notable dulness on percussion, in the left infra-scapular region, with bronchial respiration, bronchophony, and subcrepitant rales. There was a loud venous hum in the neck. After several weeks, during which the patient was under my observation, the signs denoted diminution of the solidification at the base of the left lung, and there was general improvement. In January, 1869, she again came under my observation. Three months prior to this date she had been confined with a healthy boy, weighing fifteen pounds. She had failed progressively since her confinement. She did not nurse the child, the secretion of milk speedily ceasing. There was now dulness on percussion over the base of the left lung, with increase of vocal resonance, and subcrepitant rales. The respiration was nearly bronchial over the upper lobe of this lung. Death took place during the following spring.

Case 5. Mrs. T., aged about 40, consulted me in September, 1867. The signs then showed a considerable affection of the lungs. She left her room during the following winter and spring. The cough and expectoration diminished, and she improved in appetite, weight, and strength. In July, 1868, when she again consulted me, she was five months advanced in pregnancy. Her general condition was much better than at the time of the previous consultation. There is no further record of the case.

Case 6. Mrs. B., aged 25, consulted me in September, 1869. She had had hæmoptysis in the preceding June, and repeatedly since. Cough had existed for six weeks. The menses had not appeared for two months, and there were other evidences of pregnancy. There was dulness on percussion at the left summit of the chest, with feeble respiratory murmur, subcrepitant rales, and undue transmission of the heart-sounds. She consulted me again in March, 1870. She was now far advanced in pregnancy. She was greatly emaciated and feeble, with inability to retain food. The induction of labor was advised and resorted to, but without benefit. Her death took place soon afterward.

Case 7. Mrs. V., aged 27, was admitted into hospital in October, 1848. Her illness commenced with acute pleurisy, which was followed by persistent cough. She had now a copious expectoration. There was dulness on percussion at the right summit, with deficient respiratory motion and bronchial respiration. She progressively improved, and in December she left the hospital feeling able to resume household duties. In March, 1849, she returned to hospital. She had still cough and expectoration, and the signs still showed solidification at the summit of the right lung. May 14th. She had improved, but the expectoration was still copious, and the fingers had become bulbous. The signs now showed a cavity at the right summit. In July following, the improvement had been progressive, and she left the hospital. In September, 1851, I noted that a year after this patient left the hospital, I examined the chest and found the signs of cavity still present, but the size of the cavity had apparently diminished. She had some cough, but her general health was good. I had not seen her since this examination, but I had been repeatedly informed that she was apparently quite well. She had meanwhile given birth to a living child. There is no record after September, 1851.

Case 8. Catharine B., aged 23, was admitted into hospital in November, 1866. She had been ill since the preceding July, with pain in the chest and general malaise, but cough had existed for only six weeks. Hæmoptysis occurred after her admission. The signs showed pleurisy with effusion in the right side. January 2d, 1867, she was delivered of a five-months' fœtus. Death took place January 10th. An examination after death showed miliary tubercles in the lungs in great abundance, with tubercles in the pia mater, kidneys, spleen, and liver. It is questionable in this case whether the pregnancy preceded or followed the development of the tuberculous disease.

Case 9. Mrs. S. consulted me in September, 1863. Cough had existed for four years, and prior to the past year she had had frequent attacks of hæmoptysis. She had had diarrhœa during the past year. During this year she had lost forty pounds in weight, but prior to this year she had lost but little in weight and strength. There was dulness on percussion over the summits, with an abundance of moist rales. Menstruation was regular. She had one child, a daughter, two years of age. In December, 1863, she remained in about the same condition as in the preceding September, and there is no further record of the case.

Of the foregoing cases, in No. 3 and No. 8 the occurrence of pregnancy consecutively to phthisis is doubtful. If the pregnancy were not consecutive, these cases exemplify the development of tuberculous disease during pregnancy. The apparent influence of the pregnancy on the progress of the tuberculous disease, in the remaining seven cases, severally, was as follows: In Case No. 1 the influence was not unfavorable, if, indeed, it were not favorable, two pregnancies having occurred in this case. In Case No. 2, the patient having a miscarriage, the influence was probably not unfavorable, the patient living eighteen months after the premature delivery of twins. In Case No. 4 there was progressive failure after confinement at full term, and death took place at the end of five or six months. In Case No. 5 the history extends only to the fifth month of pregnancy; and during this period the patient's condition had notably improved. She was much better than prior to the pregnancy. In Case No. 6 the influence was unfavorable, but apparently more from interference with alimentation, on account of excessive and prolonged vomiting, than from an increase of the pulmonary affection. In Case No. 7 the influence was apparently in no wise unfavorable. In Case No. 9 the patient lost but little in weight and strength until a year after confinement, when diarrhœa became a prominent symptom. It is thus seen that in five of the seven cases the pregnancy did not appear to exert an unfavorable influence, and if the case in which death was attributable to inanition be excluded, in only one case was the influence unfavorable. In two cases it would seem that the influence was favorable.

Case No. 4 affords an instance of a large and healthy child at the age of three months, pregnancy occurring in a phthisical subject. Some of the other cases may have afforded additional instances, but the histories are defective with respect to this point.

Clubbed Fingers.

In twelve cases it is noted that the fingers were clubbed or bulbous. This is a well-known symptom of phthisis, yet it is by no means pathognomonic of this disease. I have observed it in connection with empyema and pneumo-hydrothorax and with diseases of the heart. It is, however, much oftener associated with phthisis than with any other disease. The twelve cases in which its occurrence was noted in this collection represent inadequately the proportion of instances in which it occurs. As a rule, in the cases of phthisis in which it occurs, the disease is of long duration. Of eight cases in which the duration was noted, in one case cough had existed for only five months. The next shortest duration was a year and nine months. In two cases cough had existed for two years, and in one case for from two to three years. In one case cough had existed for eleven years, and in one case for from ten to eleven years. In two cases it is noted that the toes, as well as the fingers, were clubbed. In all the cases save one case, there was extensive solidification of the lung on one side, the amount of disease being moderate in the excepted case. In seven cases the left, and in five cases the right, lung was especially affected. The symptom has a certain measure of significance as denoting a large or a considerable extent of disease on one side, notwithstanding the fact that the duration of the disease, in the cases in which the symptom occurs, is usually long. I have not known the bulbous enlargement to disappear after its occurrence in any case of phthisis.

Rosy Complexion.

Notable pallor of the countenance is generally, as is well known, when associated with more or less emaciation, a visible sign which is strongly suggestive of phthisis. Different cases differ very much as regards this sign, and there is by no means a constant relation between the degree of pallor and either the amount of pulmonary disease or the extent to which it has advanced. Cases not infrequently offer a striking discrepancy in this regard, so that the facies often constitutes a very unreliable guide for judging of the anatomical changes which have taken place within the chest. Exceptionally, a patient with phthisis presents a healthy aspect; and this is true of some cases in which the pulmonary affection is considerable or even large. My cases contain illustrations of this statement. I shall content myself with citing two cases. The first case was remarkable from the rosy complexion which the patient preserved for a long time.

Case 1. Miss W., aged 18, came under my observation in March, 1864. Cough had existed for several weeks, and the menses had been suspended for several months. She had recently had hæmoptysis, which had been considered vicarious menstruation. She had a healthy aspect with a complexion which was striking from its blooming appearance. There was dulness on percussion at the summit of the chest on the right side, with diminished superior costal movements on respiration, broncho-vesicular respiration, increase of vocal resonance, undue transmission of heart-sounds, and subcrepital rales. She passed the spring months in Cuba without benefit, but improved as regards cough and other symptoms, after her return. The following winter she passed in the city, having no increase of the pulmonary affection, and her general condition was good. During this winter she was much annoyed in walking out by remarks implying that her rosy color was artificial. She began to fail in the spring of 1865, and passed from under my observation. Her death took place during the following summer.

Case 2. Miss B., aged 25, consulted me in March, 1865. Cough had existed for three years. The right side of the chest was much contracted. There was notable dulness on percussion on this side at the summit, with bronchial respiration, bronchophony, and moist rales. At the base on this side the resonance on percussion was good, and the respiration vesicular. In her appearance she was the picture of health, and declared that, excepting the annoyance from the cough and expectoration, she was as well as ever in her life.

CHAPTER IV.

FATALITY AND PROGNOSIS.

Acute miliary tuberculosis, the histories of five cases, the duration, and mode of dying—Miliary tubercles without exudation or cavities in fatal cases, death being caused by complications—Acute tuberculosis supervening on phthisis—Abstracts of the histories of forty-four cases of recovery from phthisis—Ratio of recoveries—Amount of the affection in the cases which recovered—Import of age in prognosis—Influence of sex—Do. of family predisposition—Do. of hæmoptysis—Do. of chronic laryngitis—Do. of pleurisy with effusion—Do. of perineal fistula—Symptoms denoting tolerance in the cases which recovered—Importance of determination and energy on the part of the patient—Recurrence of phthisis—Abstracts of the histories of thirty-one cases of arrested or non-progressive phthisis—Analysis with reference to the amount of disease and influence of age, sex, family predisposition, hæmoptysis, chronic laryngitis, pleurisy with effusion, perineal fistula, symptoms denoting tolerance, and duration of the disease—Recurrent attacks—Abstracts of the histories of ten cases of slowly progressing phthisis—Analyses with respect to amount of disease, age, sex, family predisposition, hæmoptysis, perineal fistula, symptoms denoting tolerance and duration of the disease—Conclusions drawn from the analyses of the cases of recovery, of arrest, and of slowly progressing phthisis—The duration of the disease, and the complications, events, or circumstances affecting duration and causing death, in fatal cases of phthisis—Case of forty years' duration—Case of twenty years' duration—Case of thirty-one years' duration—Analyses of cases of duration between ten and fifteen years—Do. of cases of a duration between five and ten years—Do. of cases of a duration between three and five years—Do. of cases of a duration between six months and a year—Do. of cases ending within six months—Propositions embodying conclusions drawn from these analyses.

My clinical studies in preparing this chapter will relate to, 1st, cases of acute miliary tuberculosis; 2d, cases of recovery from phthisis; 3d, cases of arrested or non-progressive phthisis; 4th, cases of slowly progressing phthisis, and 5th, the complications affecting duration in fatal cases, and the events or circumstances determining death in phthisis.

Cases of Acute Miliary Tuberculosis.

The sense of the term acute tuberculosis, as it is here used, is to be borne in mind. The disease ends fatally after a duration short when compared with chronic phthisis, its course being usually characterized by marked disturbance of respiration, together with rapidity of pulse and a high temperature, the post-mortem examination showing an immense number of miliary tubercles which may be equally abundant in both lungs, without exudation or the so-called tuberculous infiltration taking place, and, of course, without the changes consequent thereon, namely, the softening and liquefaction of the morbid products and cavities. In most cases tubercles exist in other organs, especially in the liver, spleen, brain, and kidneys. In Chapter I. an account of the anatomical characters in five cases is given. (*Vide* page 23.) I shall introduce here a brief account of the ante-mortem history of these five cases, taking them in the same numerical order as in Chapter I. For the anatomical characters in each of the cases, the reader is referred to the corresponding numbers in Chapter I., pages 24 et seq.

Case 1. Miss C., aged 32, on a visit at a distance from her home and apparently well, after retiring at night was seized with hæmoptysis. During the night she raised a considerable quantity of blood. There was no return of the hæmoptysis. Death took place on the 11th day after this attack. I visited her the day preceding her death. The respirations were 30 per minute, and the pulse was 120. The prolabia were livid. A slight hæmoptysis had occurred six years previously.

Case 2. A colored girl, aged 18, convalescing from typhoid fever, had a slight cough. The chest, carefully examined, gave no physical signs of disease. Three months afterward, the cough increased, the pulse became frequent, and she rapidly lost weight and strength. Death took place in about six weeks from the increase of cough, the precise duration not having been noted.

Case 3. Silas O'M., aged 68, was admitted into hospital Oct. 30th, 1850. During the preceding winter he had severe cough and hæmoptysis. Ten weeks prior to his admission he had daily paroxysms of fever with chill and perspiration for two or three weeks, followed by a course of fever which was called bilious. Diarrhœa had existed for three weeks. On his admission he was feeble and emaciated. The respirations were 24, pulse 120. Death took place November 4th, 1850.

Case 4. Franz Z., aged 58, was admitted into hospital Jan. 3d, 1859. He stated that he had felt want of breath on exercise for the preceding five years, but he had worked at his trade (shoemaking) up to the date of his admission. The respirations were from 40 to 60 per minute, and the pulse 120. January 15th, he fell and died instantly while returning from the water-closet to his bed.

Case 5. Catherine B. This case has been already introduced in connection with pregnancy, after the development of phthisis. (*Vide* Chapter III., page 177.)

The duration of the disease in Nos. 3, 4, and 5 of the foregoing cases is not determinable with precision. Of Nos. 1 and 2 the duration was, in the former, eleven days; and in the latter about six weeks. The extremes of the age in the five cases were 18 and 68 years. In the mode of dying in all the cases asthenia predominated, although respiration was notably disturbed. It is certain that the fatality is not attributable solely or chiefly to the pulmonary affection, but to something of which the tubercles constitute the local expression.

These and other cases of acute tuberculosis militate against the late doctrine which attributes the production of tubercles to the absorption of degenerated morbid products. Certainly there were no products in the lungs to occasion auto-infection, and there was no evidence of their presence elsewhere.

In some fatal cases of phthisis, the lungs contain, in more or less abundance, miliary tubercles without either exudation or cavities; but important complications, such as pleurisy with effusion, intestinal ulcerations, peritonitis, etc., coexist; and to these chiefly, or in a great measure, death is attributable. Such cases are not to be included in the category of acute phthisis, however short may be the duration. It may be supposed that exudation and cavities would have taken place had life not been shortened by the coexisting complications. It may be of interest to introduce here an account of some cases of this description.

Case 1. A soldier, 35 years of age, came under my observation in May, 1839. He complained of dyspnœa, and his pulse was rapid. He had also diarrhœa, which continued up to the time of his death. He had but little cough and expectoration. Death took place in September, 1839. The following were the post-mortem appearances: pleurisy with effusion on the right side, and a few miliary tubercles in the right lung; the left lung crammed with miliary tubercles, some hard and semi-transparent, others opaque and cheesy; no exudation nor cavities; the bronchial glands enlarged and cheesy; peritoneal adhesions;

a patch of ulceration in the lower part of the ileum; mesenteric glands enlarged.

Case 2. On taking medical charge at a military post November 16, 1840, I found in hospital a soldier, much emaciated, with rapid respirations and frequent pulse, cough and expectoration being slight. Diarrhœa had existed, but it was easily controlled by opiates. He had had rubeola in the preceding June, and, after thirty days, had been returned for duty. He was admitted again into hospital October 2, and the disease had been recorded *febris intermittens.* Cough had existed from his discharge to his readmission. Death took place December 5, 1840. On post-mortem examination the left pleural cavity was found to contain three pints of sero-lymph, and the compressed lung contained numerous miliary tubercles. The right lung was crammed with miliary tubercles, and there were universal pleuritic adhesions on this side. The peritoneal cavity contained several quarts of serum; the liver was enlarged; there was a single round ulcer in the stomach, and in the small intestines were numerous ulcerations; the mesenteric glands were much enlarged and caseous.

Case 3. In this case there was double pleurisy, with considerable effusion in both sides, and also pericarditis, death being attributable to these complications. An account of this case is introduced under the heading "Pleurisy with Effusion," in Chapter III. (*vide* page 141).

Case 4. There is no ante-mortem history noted in this case, but only the appearances after death. The miliary tubercles in the lung were not numerous, and so minute that, without close inspection, they would have escaped notice. They were chiefly situated between the lobes; otherwise the lungs presented a healthy appearance. Both pleural cavities contained a considerable quantity of turbid, liquid effusion; the peritoneal surfaces were thickly studded with tubercles. There is no note of morbid appearances in other organs.

Acute tuberculosis may be developed in a patient with long-standing, non-progressive, innocuous disease which had led to the formation of cavities. This is illustrated by the following case, which, inasmuch as there were cavities, was not included in the list of cases of acute phthisis.

A male patient, admitted into the Charity Hospital, New

Orleans, in the service of the late Professor Fenner, stated that he had been ill only five weeks, and that prior to this time he was in good health, having no cough nor other pulmonary symptoms. On his admission he had cough without expectoration, with dyspnœa, rapid breathing, and lividity. Death took place three days after his admission. On examination post-mortem a cavity was found at the apex of the right lung larger than an English walnut, empty, anfractuous, and lined by a serous-like membrane. Another small cavity existed at the summit of this lung. At the apex of the left lung was a cavity of the size of an American walnut; and this, like the others, empty and lined by a smooth membrane. Elsewhere both lungs were crammed with miliary tubercles of the size of pins' heads, not hard and semi-transparent, but opaque and cheesy. There was no tuberculous infiltration.

The cavities in this case were considered as representing phthisis of ancient date, from which the patient had recovered as regards all symptoms of disease. The miliary tubercles represented an attack of acute tuberculosis of six weeks' duration. There was no pathological connection between the two attacks, excepting that, in accordance with the doctrine of a tuberculous diathesis, this entered into the etiology of each.

Cases of Recovery from Phthisis.

The study of the cases of recovery from phthisis is not only of much interest, but it has great importance in its relations to prognosis, and, also, to the management of the disease. In the latter relations the cases will claim consideration in the next chapter. As regards prognosis, they are to be studied especially with reference to the following points of inquiry: 1. The bearing on the prognosis of the amount of the pulmonary disease, and the extent of damage compatible with recovery; 2. Circumstances aside from the amount of the disease which are to be regarded as either contributing to the recovery, or as favorable thereto.

There are two questions which are to be taken into account before entering on the study of these cases. The first is, what constitutes proof of recovery from phthisis? If a patient affected with phthisis regain the conditions of health which existed prior to the development of the disease, pertaining to weight, muscular strength, and general vigor; if there be disappearance of all pulmonary symptoms; if this restoration be maintained for a series of months, and, finally, if physical exploration of the chest disclose no signs of any morbid process in the lungs, it is fair to pronounce recovery as having taken place. The fact of the recovery is not invalidated by the return after a greater or less period of the symptoms and signs of phthisis. They do return in a certain proportion of cases. This return denotes a recurrence of the disease, and it may have no more to do with the previous affection than the successive relapses of intermittent fever have to do with each other. When we arrest an attack of intermittent fever, and the patient is restored to health, we consider recovery to have taken place; but experience teaches that, in most cases, at periods more or less remote, the patient will again have intermittent fever. So, undoubtedly, after recovery from phthisis, there is a liability to its recurrence at some future time; but in such instances the recurrence is a distinct affection, having no necessary pathological connection with that which had previously occurred. The occurrence of phthisis more than once in the same patient, will be one of the topics which will engage attention in the study of the cases of recovery.

The second preliminary question relates to accuracy in the diagnosis of phthisis. Is it certain that, in all the cases in this category, phthisis actually existed? In answer to this question, I have to state, that in nearly every case the evidence of the present or past existence of the disease included the signs furnished by a physical examination of the chest. The diagnosis, however, in all the cases, was not made while the disease existed. Some cases came under my observation after recovery had taken place. In these cases the diagnosis was retrospective, being based on the present signs obtained by physical exploration together with the previous history. Phthisis leaves within the chest permanent traces which are discoverable by physical exploration. What physical signs, it may be asked, are adequate to establish existing or past phthisis? This is a question of fundamental importance. The analysis of the cases would be of little or no value if there be room for doubt as to the accuracy of the diagnosis. Appreciating fully this requisite, I shall give a synopsis of all the cases, and the synopsis of each case will embrace the symptoms and signs on which the diagnosis was based. To the reader, then, will be submitted the data for exercising his own judgment as regards the correctness of the diagnosis. Proceeding now to give an account of the cases of recovery from phthisis, I shall offer, in connection with a few of the cases, such comments as may be suggested, and afterward give the results of an analysis of the cases with reference, especially, to the points of inquiry which have been stated.

Case 1. *A small Pulmonary Affection; Expectoration of Calculi thirteen years after recovery.*—This case has been already introduced. (*Vide* Chapter III.) The patient during the winter of 1842–43 had a dry hacking cough, and subsequently expectorated, in great number, pulmonary calculi at intervals of several weeks. In June, 1843, he had regained weight and strength, which had been diminished during the preceding winter. The only physical sign noted, at this time, was feebleness of the respiratory murmur. The expectoration of calculi continued from time to time afterward, but at length ceased, and thirteen years after this date he called upon me and reported himself in excellent health. Prior to the development of the disease the patient had worked very hard on a farm. He left home for several weeks, and, afterward relinquishing severe labor, engaged in buying and selling new lands in Illinois, a business which required much out-of-door life. There was no medicinal treatment in this case.

Case 2. *A small Pulmonary Affection; well twenty-three years after recovery.*—D——, 22 years of age, had two attacks of hæmoptysis in 1851. His mother died with phthisis. There was dulness on percussion in the left infra-clavicular and scapular regions, with dry crackling on both sides. Three months afterward, marked improvement in his general health having taken place, the dulness on percussion continued, with crackling distinctly marked on the left, and slight on the right side. The recovery was complete, and at this time, 1874 (twenty-three years), he has robust health. At the time when the pulmonary affection took place, he was pallid and lost weight. He went into the country and passed some time in field sports. The following winter was spent at the South.

Case 3. *A small Pulmonary Affection; well five years after recovery.*—A. C., aged 19, consulted me in May, 1852, for cough and expectoration, which had existed for only a few weeks. There was dulness on percussion at the left summit, with broncho-vesicular respiration, and vocal resonance greater than on the right side. In June, 1852, the same physical signs existed. The patient was a printer's apprentice, and had worked for two years closely as a compositor. He went into the country for a short time, and his general health improved. He then relinquished the occupation of a printer, and obtained a situation as salesman in a paper warehouse. The pulmonary symptoms in a short time ceased; he regained his strength and healthy aspect, and five years afterward was in excellent health. The only medicinal treatment in this case consisted of a little morphine to allay cough, and the citrate of iron and quinia continued for a short time. He had lost a brother with phthisis.

Case 4. *A small Pulmonary Affection; well a year after recovery.*—Dr. B., aged 28, had hæmoptysis in October, 1852, supposing himself at that time to be in perfect health. In January, 1853, he had a recurrence of the hemorrhage, and before May 17th, 1853, two more attacks. On this date there was slight dulness at the right summit, with weakened respiratory murmur, and crackling which accompanied inspiration and expiration. In September, 1854, he reported himself well. He had gained in weight and had no pulmonary symptoms. There was still some dulness at the right summit, and the respiratory murmur was feeble, but unaccompanied by rales. He had continued without interruption in the practice of medicine in the country.

Case 5. *A small Pulmonary Affection; Retrospective Diagnosis; well four years after recovery.*—I examined the chest of Dr. N., a practitioner of medicine, in the winter of 1854–55. His father was not living, but he did not die with phthisis, and his mother was living. In 1848 he was engaged in school teaching, and his general health suffered; he lost weight, his appetite became impaired, and his muscular strength diminished. During this year he had two attacks of hæmoptysis. In the winter of 1848–49 he attended medical lectures, and during the winter he had cough, with expectoration, and a sense of constriction in the chest. At the close of the lecture-term he had a profuse hæmoptysis, and continued to raise blood for several days. Shortly afterward he engaged in medical practice in the country. His practice lay in a rough part of Kentucky. His habits became very active. His cough ceased soon after he commenced practice. He became strong and vigorous, gained in weight, and all symptoms of pulmonary disease ceased. He had no medicinal treatment at any time, except that he took a little acetate of lead with opium and tannic acid during the last hemorrhage. His habits were temperate. The chest presented the following signs: No deformity, the superior costal movements on the left side diminished, distinct dulness on percussion at the left summit in front and behind, the respiratory murmur at the summit on this side so feeble as to be scarcely appreciable, while it was well evolved on the right side.

Case 6. *A small Pulmonary Affection; well six months after the development of the disease.*—Mr. S., age not noted, singing master, had hæmoptysis, not proceeded by cough, in August, 1855. Slight cough and expectoration followed. A fortnight after the hemorrhage there was distinct dulness on percussion at the left summit of the chest, with broncho-vesicular respiration. He had lost somewhat in weight, and there was some want of breath on exercise. Six months afterward I received a letter from this patient, informing me that he was in good health.

Remarks.—From the shortness of the period, in this case, after the development of the disease, when the patient reported himself well, there may be room for doubt whether recovery had taken place. The pulmonary affection may have simply become latent. Assuming recovery to have taken place, the case illustrates what I believe to be of not very infrequent occurrence, namely, the speedy abortion, as it were, of phthisis, that is, an arrest taking place when the disease has made but little progress. This may happen several times in a case until, at length, a recurrence occurs in which the disease advances.

Case 7. *A considerable Pulmonary Affection; apparently well two years after the development of the disease.*—Mr. C., aged 32, constable, was examined by me in April, 1856. Hæmoptysis had occurred six years before, but it was not followed by cough, and he had good health up to December, 1855, when his existing cough began. Shortly after this date he had another hemorrhage, which recurred daily for ten days. The cough persisted, and the expectoration became abundant. He had lost considerably in weight; he was subject to night-sweating; occasional chills had occurred, and his voice had for some time been husky. There was marked dulness on percussion at the summit of the chest on the right side, with an amphoric intonation; the respiration was bronchial, and the whispered voice was bronchophonic. Shortly afterward the patient had an acute affection which was probably pneumonia. He was much prostrated, and he had hæmoptysis recurring for several days. These facts were obtained from the attending physician. In December, 1856, I noted that I was accustomed to meet this person frequently in the streets, and he presented an appearance of health. His physician informed me that his cough and expectoration were slight, and that he was able to discharge all the duties of his vocation. May 10th, 1857, I noted that I continued to see this person from time to time, and that he seemed to be quite well. There is no further record of the case. The treatment consisted of cod-liver oil for several weeks, generous living, the use of malt liquor, and out-of-door life.

Case 8. *A small Pulmonary Affection; well six months after recovery.*—M. D., aged 22, clerk in clothing store; both parents not living; mother died of cholera, and the disease of which his father died unknown; was examined by me in August, 1856. Cough had occurred two months previously, but it had entirely ceased, when a week before my examination he had hæmoptysis, and the hemorrhage had recurred for three successive nights. Following this was slight cough with small expectoration. His aspect was not morbid. The pulse was 80, and the respirations 20. There was distinct dulness on percussion at the summit of the chest on the right side, with relative feebleness of respiration, increase of bronchial whisper on this side, and subcrepitant rales on both sides. In October, 1856, this patient reported that he had no cough, and that in all respects he was well. His aspect was healthy, and he had gained in weight. May, 1871, I noted that he continued to be in excellent health, with no return of cough. There is no further record of this case. He continued his occupation as a clerk, and had no medicinal treatment.

Remarks.—This case affords an illustration of a small affection, speedily abating, the arrest taking place without any medication while the patient continued in the occupation of an indoor clerk.

Case 9. *An Affection at the base of the Left Lung, the patient well six years after the date of my examinations.*—I examined Mr. C., joiner, aged 35, first in September, 1856. Cough had existed for three months. Of late it had increased, and it was accompanied by considerable expectoration. He had night-sweating, and he presented a thin, pallid appearance. There was marked dulness on percussion at the base of the left lung, with a vocal resonance greater than on the right side, whispering bronchophony and subcrepitant rales. The respiratory murmur was very feeble. The same signs were found on two subsequent examinations, the last in January, 1857. In May, 1857, it was noted that there had been progressive improvement, and that the patient was able to resume work. In September, 1862, his attending physician informed me that the patient had recovered, and was then in good health. He had relinquished his trade and gone into the country on a farm. The treatment consisted of cod-liver oil, the use of malt liquor and spirits moderately, generous diet, sponging the body in cold water daily, and out-of-door life in all kinds of weather.

Case 10. *A considerable Pulmonary Affection; speedy arrest and recovery; well a year and seven months after the development of the disease.*—Mr. B., aged 26, clerk, was examined by me in September, 1857. Cough and expectoration had existed for five weeks. There was marked dulness at the summit of the chest on the right side, with some depression and diminished motion, bronchial respiration and bronchophony, increase of vocal fremitus, and an abnormal transmission of the heart-sounds. In April, 1859, his attending physician informed me that this person was then in good health. A slight hæmoptysis took place during the winter of 1857–58, and again during the following winter. The cough had entirely ceased; he had regained his average weight of health, and was in all respects well. After my examination in September, 1857, he went into the country, and he had been occupied as a farmer ever since. He took cod-liver oil for several weeks, and he had taken beer or some form of alcoholic stimulant up to the time of the last note.

Case 11. *A considerable Pulmonary Affection; well a year after the date of examination.*—Mr. W., aged 19, was examined by me in November, 1856. Parents both living and no family predisposition to phthisis. He had had good health prior to July, 1856. He had then apparently contracted a bronchitis from which he seemed to recover, but meanwhile he lost in weight and strength. The cough returned in September, and continued with small expectoration. There was marked dulness on percussion at the summit of the chest on the right side, with diminished superior costal motion, a feeble inspiration, and a prolonged, high expiratory sound in front, bronchial respiration over the scapula, bronchophony in front and behind, and abnormal transmission of the heart-sounds. The treatment advised consisted of cod-liver oil, generous diet, ale or porter, as much out-of-door life as practicable, and tonic remedies. In September, 1857, an intelligent friend of the family informed me that the measures of treatment had been faithfully carried out; that the patient passed the winter at the South, returning home much improved, and that he was then in good health.

Case 12. *A moderate Pulmonary Affection; well nearly six years after recovery.*—Mr. D., aged 42, clerk, was examined by me in May, 1857. A profuse hæmoptysis had occurred in the preceding January. This was not preceded, but immediately followed by cough, which had continued with small expectorations. A second attack of hæmoptysis had occurred five weeks before my examination, and meanwhile it had recurred several times. There was moderate dulness on percussion at the summit of the chest on the right side, with broncho-vesicular respiration and bronchophony. The treatment advised consisted of a generous diet, out-of-door life, alcoholic stimulants (to which he was not accustomed), and cod-liver oil. He had recurrence of hæmoptysis on two successive days shortly after my examination, and he was quite feeble for several weeks. After the hemorrhage ceased, he began to take the cod-liver oil, but was obliged to discontinue it on account of the disturbance of the stomach occasioned by it. The only treatment then pursued was the use of whiskey, with generous diet and out-of-door life. I saw the patient for the first time, after my examination, in September, 1857. He had improved so much that I did not recognize him. He had gained in weight thirty pounds. He was entirely free from cough, and had been so for several weeks. He had taken a pint of whiskey daily, but he had recently reduced the quantity to two glasses. He stated that it was not difficult for him to lessen the quantity; he had acquired no fondness for it. I saw him in consequence of a slight recurrence of the hæmoptysis, and I advised to increase for a time the quantity of whiskey. I heard nothing further of the case until October, 1860, when I was informed by the person who employed him as a clerk, that his health was perfectly good—never in his life better—and that he had discontinued the use of stimulants. In January, 1863, I again learned from the same source that he was in excellent health and perfectly temperate.

Case 13. *A small Pulmonary Affection; Recurrence of the Disease three years after recovery; Pregnancy prior to the recurrence.*—Mrs. R., age about 22, during the summer of 1853 had cough with expectoration, loss in weight and strength, and physical signs (which were not noted) showing a small tuberculous affection. She passed the following winter at the South. On the journey thither she had an attack of hæmoptysis. On her return she was free from cough and in good health. She took tonic remedies, chiefly quinia and iron, and, for a short time, cod-liver oil. In the summer of 1854 she became pregnant, and bore a healthy child, now (1874) a young lady 20 years of age, in excellent health. She (the mother) regained a rosy complexion, and continued well until the autumn of 1857. A recurrence of the pulmonary affection then took place. During the winter she went to South Carolina, and improved in a marked degree. She was treated with quinia, iron, whiskey 8 to 10 oz. daily, cod-liver oil, and she was much in the open air. She passed the winter of 1858–59 in South Carolina, returned home in the early part of the summer of 1859, and died shortly after her return.

Case 14. *A small Pulmonary Affection; Speedy Recovery; well four years after the date of my examination.*—Dr. T., aged 30, consulted me in October, 1857. In January, 1857, he had a slight hæmoptysis. Prior to this he had noticed a slight cough, but otherwise he was apparently quite well. He had recurrence of the hæmoptysis twice after intervals of two or three weeks. Slight cough and expectoration had continued. Meanwhile he had kept on with his duties as a medical practitioner in the country. He had lost moderately in weight; the only treatment pursued was drinking daily about a pint and a half of beer with generous diet. There was distinct dulness on percussion over the left scapula, with feeble respiratory murmur in front and behind at the left summit, and a bellows murmur in the left subclavian artery. In January, 1862, I met Dr. T. casually on his way to Hilton Head, S. C., as an army surgeon. He had the appearance of health, and stated that he was perfectly well. He had another recurrence of hæmoptysis shortly after my examination. He pursued the same course as before, namely, drinking beer, living generously, with an abundance of exercise out of doors.

Case 15. *A considerable Pulmonary Affection; well three years after the date of my examination.*—Dr. B., aged about 30, consulted me in September, 1858. He had had good health prior to the spring of 1857. He then had pleurisy, which confined him to the house for three months. He gradually returned to his practice, feeling want of breath on exercise for some time. During the winter of 1857–58 he recovered his health as he supposed, perfectly. The cough ceased, he regained his usual weight, and was able to perform fully his duties as a medical practitioner. Prior to the pleurisy he had had a slight hæmoptysis which was unattended by cough. He stayed within doors for a day, and then went on with his business as usual. In the spring of 1858 he began to cough and to lose in weight. The cough continued with small expectoration, and at length he felt obliged to quit practice. There was marked contraction of the right side of the chest, with notable dulness at the summit on this side, broncho-vesicular respiration, and whispering bronchophony. There was no evidence of liquid in the pleural cavity. He was advised to take cod-liver oil and alcoholic stimulants, to live out of doors, and to pass the winter in a mild climate. In November, 1861, a medical friend of Dr. B. gave me the following account: After consulting me in September, 1858, he went to Philadelphia, and passed the winter there attending medical lectures. He was unable to take the cod-liver oil, but he took stimulants freely. In the spring he returned to his home, in central New York, much improved in health. He took charge of the medical business of my informant for a time, and then went to Michigan where he passed the summer. The next winter (1859–60) he passed in Philadelphia, returning home in the spring; and he had remained at home actively engaged in medical practice until recently, when he went on to Washington to get an appointment as army surgeon. His health was robust. He continued the free use of alcoholic stimulants for some time, but he had ceased to use them habitually, being no more inclined thereto than prior to his illness.

Case 16. *A small Pulmonary Affection; well over fourteen years after recovery.*—Miss S., aged 30, was examined by me in May and in October, 1859. Cough with small expectoration had existed for six months. She had lost moderately in weight. There was dulness on percussion at the summit of the chest on the right side, with deficient superior costal motion, some flattening, and broncho-vesicular respiration. Tonics, alcoholic stimulants, and abundant out-of-door life were advised. She improved, as regards weight and strength, after my examination in May, and in October the cough and expectoration were slight. She had taken about an ounce of whiskey daily, and a portion of the time chalybeates; she had passed, on an average, three-fourths of the daytime in the open air. The recovery became complete, and, at this time (1874), she is in good health.

Case 17. *A small Pulmonary Affection; Recovery and Recurrence after six or eight years; Recovery from the Recurrent Affection, and well fifteen years afterward.*—Prof. B., an eminent medical teacher, author, and practitioner, was examined by me in September, 1859. He was then 40 years of age. Eight or ten years prior to this date he had symptoms denoting a tuberculous affection. He was then examined by Dr. Bowditch, of Boston, who found signs denoting that affection. He had repeated attacks of hæmoptysis. He went to Europe and remained from one to two years. His pulmonary symptoms ceased, and he regained health completely. Two years prior to my examination he again had cough; his general health failed; he lost twenty-five pounds in weight, and chronic laryngitis took place. At the time of my examination his cough was slight, his aspect was healthy, and he had regained his healthy standard of weight. There was distinct dulness on percussion at the right summit of the chest, with weakened respiratory murmur and increased bronchial whisper. He had afterward a profuse hæmoptysis, but he has been otherwise free from pulmonary symptoms, and has had good health up to the present time (1874). Most of the summer seasons for the past ten years have been passed in Europe. His voice has remained husky.

Remark.—The previous history in this case shows the occurrence of phthisis twice, and recovery.

Case 18. *A small Pulmonary Affection; well a year after the date of my examination.*—Mr. W., aged 30, planter in Mississippi, consulted me in February, 1860. None of his family had had phthisis. He had had cough and small expectoration during the winter. Not much loss in weight. There was dulness on percussion at the left summit of the chest, with diminished superior costal movements, notable feebleness of the respiratory murmur, increase of vocal resonance and whisper, and crumpling rale at the end of inspiration. Advised generous diet, the moderate use of alcoholic stimulants, life in the open air, cod-liver oil and the hypophosphites. In February, 1861, an intelligent student of medicine, who had recently seen Mr. W., brought from him to me a message that he was in good health.

Case 19. *A small Pulmonary Affection; well nearly a year after the date of my examination.*—Mr. F., medical student from Texas, consulted me in February, 1863, in New Orleans. Slight cough had existed for several weeks, following rubeola. Hæmoptysis had occurred the day before my examination. There was dulness on percussion at the summit of the chest on the right side, with deficient motion, broncho-vesicular respiration, increase of vocal resonance and whisper, a slight pleural friction murmur, and undue transmission of the heart-sounds. He was advised to quit lectures, to live in the open air, and take an alcoholic stimulant moderately. December 30, 1860, I noted that he had been in New Orleans recently, appearing to be perfectly well, and entirely free from pulmonary symptoms. An examination now showed no disparity at the summit of the chest as regards costal motion; the dulness at the right summit scarcely exceeded that of health; the respiratory murmur was here relatively feeble, and the disparity in other respects hardly greater than normal. The vocal resonance was notably greater than on the left side; the heart-sounds were louder, and there was still crumpling at the end of inspiration. After my first examination he left New Orleans. He took no medicine. He took a small quantity of whiskey, with his meals, three times daily. He lived well, and much of the time was out of doors. He resided in a part of Texas in which the air was dry and bracing. He had recovered his full weight of health, and his aspect was healthy. January 27, I noted that he was still in New Orleans, and well.

Case 20. *A small Pulmonary Affection; Spontaneous Arrest; Retrospective Diagnosis; well fourteen years after recovery.*—Miss B., aged 30, was examined by me in October, 1861. I found distinct relative dulness on percussion at the summit of the chest on the left side, with broncho-vesicular respiration. There were now no pulmonary symptoms, but three years prior to this date she had cough and expectoration for six months, with loss in weight and want of breath on exercise. She took only some simple cough remedies, and did not materially alter her habits of life. After recovering from the cough she had had good health, and she was well in 1873. Both parents of this patient had phthisis, and she had lost by this disease three sisters and two brothers. A surviving sister has had a small tuberculous affection, and recovered. (Case No. 23 in this list.)

Case 21. *A considerable Pulmonary Affection; well seven years after the date of my first examination.*—Mr. L., aged 24, was first examined by me in June, 1867. Cough and expectoration had existed for some time. He had had hæmoptysis repeatedly. The signs over the middle third of the right side of the chest showed considerable solidification. There was no family predisposition to phthisis. The appetite and digestion were fair. I made a second examination in September, 1867. He had travelled in the mean time, hunting and roughing it, in Maine. There had occurred four attacks of hæmoptysis. His general aspect was good. He had considerable cough and expectoration, and recently he had been subject to diarrhœa. Bronchial respiration and bronchophony existed in the right infra-clavicular region, with subcrepitant rales. I examined him a third time in May, 1868. He had passed the winter in Florida, and lived in the open air. He had gained in weight, and his general appearance was much improved. The signs now were at the summit of the chest, on the right side, dulness on percussion, increased vocal resonance, feeble respiratory murmur, and subcrepitant rales. He had taken no medicine, but he had drank whiskey pretty freely. In November, 1868, I noted that he had passed the summer in Minnesota, and had held his own as regards weight and strength. His aspect was healthy. There were now at the summit of the chest, on the right side, dulness on percussion, weak respiration, and subcrepitant rales. In May, 1869, I noted that shortly after my last examination he sailed for Gibraltar, and that during the voyage he lost his cough, and improved in other respects. He had had occasionally diarrhœa. His aspect was now healthy. There was dulness on percussion at the right summit, with weak respiration; but the latter was vesicular, and without rales. In November, 1869, I noted that he had passed the summer in the country, near New York, and had occupied himself much of the time in rowing. He reported himself well, excepting a slight cough and expectoration. There was slight dulness at the right summit, with feeble respiratory murmur. He had taken no remedies, and had discontinued without difficulty, several months previously, the use of whiskey. In May, 1874, I noted that Mr. L. called and reported himself in excellent health. He had no pulmonary symptom, and was fat and strong. There was now depression at the right summit, with relatively feeble respiratory murmur.

Case 22. *A small Pulmonary Affection; well nine years after recovery.*—I examined Mr. H., aged 22, in July, 1867. He stated that three or four years prior to this date he had pulmonary symptoms, and was pronounced tuberculous by Prof. Alonzo Clark and the late Dr. Cammann. At the time of my examination he had no pulmonary symptoms. He had lived at Orange, New Jersey, and had been closely occupied within doors, in his business, which was dealing in ship bread and crackers. No medical treatment is noted. At the right summit of the chest the inspiratory sound was interrupted, the vocal resonance and whisper were increased, and the heart-sounds were unduly audible. There was no appreciable abnormal dulness on percussion. He remained well until May, 1874, when he was attacked with pneumonia which affected both lobes of the right lung and proved fatal.

Case 23. *A small Pulmonary Affection; Spontaneous Arrest; well fifteen years after recovery.*—Miss B., aged about 22, was under my observation in January, 1862. She is a younger sister of Miss B. (*vide* No. 20). Both parents, three sisters, and two brothers have died with phthisis. She had hæmoptysis in January, preceded by dry cough. There was dulness on percussion at the summit of the chest on the right side, with feebleness of the respiratory murmur, a crepitant rale, and increase of vocal resonance. No remedy of any importance was given, and no material change made in the habits of life. The cough ceased in February, 1860, and she had no subsequent return of either cough or hemorrhage. She was well in 1875.

Case 24. *A small Pulmonary Affection; Recovery; the disease after several years recurring and ending fatally.*—Miss L., aged 50, took cold as she supposed in the autumn of 1859, and her cough continued throughout the winter. In April she had a small hæmoptysis. The cough continued, with abundant expectoration, and she lost considerably in weight. She was, and had been for many years, a teacher, her duties keeping her constantly within doors. She lived at a distance (Montreal, Canada), and consulted me by letter. I advised tonics, alcoholic stimulants, with out-of-door life, and cough-palliatives. Tonics she did not take; stimulants she thought did not agree with her, and she only made a brief trial of them; my advice as regards going out of doors she followed to some extent, and she took a little paregoric elixir to allay cough. She did not relinquish her duties as a teacher, but devoted herself to them somewhat less assiduously, being relieved, in part, by an assistant. A portion of the summer she spent in travelling. She began to improve in January, 1861, and in the following May the cough and expectoration were slight. I examined the chest in May, 1862. The pulmonary symptoms had then disappeared; she had regained her usual weight and strength, and her appearance had never been better. There was abnormal dulness with feeble respiration and increase of resonance and whisper at the right summit. In March, 1863, I noted that she remained in excellent health. In February, 1868, I noted that she had had good health until recently. Meanwhile she had spent a summer in Europe, and for two years had held the responsible position of lady directress in a female college. Cough and expectoration had recently returned, and she had had a moderate hæmoptysis. There was dulness on percussion at the right summit with subcrepitant rales. In the spring of 1868, she had hæmoptysis repeatedly. In the autumn she looked well, and reported well with the exception of some cough and expectoration. She had no treatment excepting a little quinia and small doses of morphia to allay cough. In December, 1869, the symptoms and signs denoted increase of the affection. She failed slowly and died in the spring of 1871.

Case 25. *A moderate Pulmonary Affection; well twenty-seven years after recovery.*—Mr. G., aged 37, a highly intelligent person, gave me the following statement in July, 1862. Seventeen years prior to this date, he had a profuse hæmoptysis. He consulted the late Dr. A. Sidney Duane, who informed him that he had consumption, and that he probably would live only a few months. He afterward consulted the late Dr. Cammann who pronounced him tuberculous. At this time he was a clerk, and his duties confined him within doors. He went to Europe, and when in Paris he consulted Louis who confirmed the opinion of Cammann. He took only some slight palliative remedies. He returned from Europe well, and remained in excellent health for seven years, when he had cough for several weeks with loss of weight and strength. He passed the winter in Louisiana and Texas, returning in good health. In August, 1867, he consulted me, having had some cough and expectoration for six weeks. On examination of the chest I found only a relative weakness of the respiratory murmur at the summit of the chest on the left side, and an undue transmission of the heart-sounds. In June, 1869, he again consulted me, and I examined the chest with the same result as before. He had now a subacute pharyngitis. Otherwise his health was excellent.

Case 26. *A small Pulmonary Affection; Spontaneous Arrest; well ten years after recovery.*—Mr. C., aged 25, bank clerk, consulted me in February, 1864. There was no family predisposition to phthisis. He had some affection of the knee-joint, causing some lameness for several years. A slight cough had existed for several weeks. A slight hæmoptysis had occurred the previous evening. He was but little under his average weight of health. There was distinct dulness on percussion at the summit of the chest on the left side and slight broncho-vesicular respiration. In May, 1864, I noted that he left the bank, and went to Washington, D. C., his residence being in western New York. He had been out of doors much of the time. He had discontinued the use of alcoholic stimulants, which he had taken to some extent before consulting me, on account of his feeling of debility. He returned from Washington free from cough and looking well. The only medicinal treatment was the use of the citrate of iron and quinia. He has had no return of the pulmonary affection now after the lapse of ten years.

Case 27. *A moderate Pulmonary Affection; well nearly ten years after the date of my examination.*—Mrs. L., aged 40, residing in Canada, consulted me in August, 1864. She had generally had good health. Both parents had died at an advanced age. She had had several children, the youngest being two and a half years old. In May, 1864, when in England, she seemed to have contracted a cold, and cough with moderate expectoration had continued. She had not had hæmoptysis. She was but little below her average weight of health. The appetite and digestion were good. There was dulness at the left summit of the chest, with weakened respiratory murmur, the local resonance and whisper being louder than at the right summit. The heart-sounds were unduly transmitted, and there was a bellows murmur in the subclavian artery. Cod-liver oil, alcoholic stimulants, generous diet, and life in the open air were advised. I have no notes of this case afterward, but I have been informed repeatedly by her relatives that she recovered and has remained in good health.

Case 28. *A moderate Pulmonary Affection; recurrence five years after recovery.*—Mr. A., manufacturer, consulted me in October, 1864. His mother died of consumption at the age of 32. He had had a slight hæmoptysis two years prior to the above date; a second attack occurred in the spring of 1864, and subsequently a third attack, in all the hemorrhage having been small. He had not, and had not had, cough. He was ten pounds under his average weight of health. The physical examination of the chest was negative. Generous diet, life in the open air, and the moderate use of alcoholic stimulants were advised. In July, 1865, he again consulted me. He had had hæmoptysis repeatedly since the previous examination; and for the preceding month, for the first time there had been cough with expectoration. He had lost ground as regards appetite, strength and weight. There was now dulness on percussion at the summit of the chest on the right side, with increase of vocal resonance, broncho-vesicular respiration, and an abnormal transmission of the heart-sounds. He decided to give up his business and go to Minnesota. He did so, and returned in the autumn in good health. He remained well, engaging largely in business, until the autumn of 1862, when he had an attack of hæmoptysis followed by cough and expectoration. This account he gave me in January, 1872, when he again consulted me. There was now dulness on percussion at the summit of the chest on the right side, with feeble respiratory murmur, increase of vocal resonance and whisper, abnormal transmission of the heart-sounds, and clicking rale. He had decided to go to California. He subsequently died.

Case 29. *A small Pulmonary Affection; well eight years after recovery.*—Mr. N., aged 27, consulted me in August, 1865. Both parents with several brothers and sisters were living and well. Profuse hæmoptysis had occurred nineteen months previous to the above date. He had had two attacks since, both profuse; the last attack was recent. Cough had been and was slight. His general health had been good. When the first attack of hæmoptysis occurred, he was in business in New York. After this attack he travelled considerably on horseback, and had passed some time in Cuba. There was slight dulness on percussion with weak respiration at the summit of the chest on the left side; and over the left scapula the respiration was broncho-vesicular. A sea voyage and travelling in the South during the winter were advised. In January, 1866, I noted that he had been in Europe, and had pleurisy during the voyage. There was considerable effusion. When in London he was under the care of the late Dr. Hyde Salter. In October, 1866, I noted that he was free from all pulmonary symptoms, and that he had an aspect of perfect health. He was now engaged in the business of a broker in New York, but taking considerable exercise out of doors. Slight dulness on percussion and feebleness of the respiratory murmur at the summit of the chest on the left side continued. In February, 1867, I noted that he had recently married, and was going to Savannah to avoid the spring climate in New York. His general health was excellent. In a letter received in August, 1867, he says: "My health has been for the summer thus far excellent. I weigh 150 pounds (two years ago 109), and I am almost entirely free from cough." In the autumn of 1868 he went to Minnesota, and has since resided there. In the summer of 1873 he called upon me. He had grown stout;

he had no pulmonary symptoms, and his health was in all respects excellent.

Case 30. *A small Pulmonary Affection ; well six years after date of examination.*—Mrs. J., recently married, her husband having died within a month after the marriage, consulted me in March, 1866. No hereditary predisposition to phthisis. There was much mental depression and nervous excitability, occasioned by her recent bereavement. She had some cough, and had lately had a slight hæmoptysis. She had lost somewhat in weight, but her muscular strength was not much impaired. There was slight dulness at the summit of the chest on the right side, with weakened respiratory murmur, increase of vocal resonance and whisper, and abnormal transmission of the heart-sounds. I advised the climate of Philadelphia for the remainder of the spring, a tonic remedy (citrate of iron and quinia), and out-of-door life. I have no further notes of this case; but she soon afterward went to Europe where she has since resided, and I have heard of her repeatedly as well.

Case 31. *A small Pulmonary Affection ; well a year after recovery.*—Mr. G., aged 21, clerk in the clothing store of his father, consulted me in April, 1866. Both parents were living. He had had a slight hæmoptysis in the preceding January, and a recurrence recently. There had not been, and was not now, any cough. He had not lost in weight. The appetite and digestion were good. He had some pharyngitis. There was no appreciable abnormal disparity on percussion between the two sides of the chest, but at the summit on the right side the respiration seemed abnormally broncho-vesicular. There was a distinct pleuritic friction murmur in this situation. I advised a trip to Minnesota, which he did not take, but he adopted my advice as to more out-of-door life, and the use of tonic remedies. In February, 1867, he again consulted me; in the mean time he had had another attack of hæmoptysis. He had, however, gained in weight 15 lbs. There was now slight abnormal dulness at the summit of the chest on the right side, with distinct broncho-vesicular respiration, increase of vocal resonance and whisper, and an abnormal transmission of the heart-sounds. I advised a voyage to Europe. In May, 1868, his attending physician informed me that he followed this advice, living out of doors, making pedestrian excursions; that he returned in excellent health, and had remained well.

Case 32. *A considerable Pulmonary Affection; well five years after recovery.*—Dr. M., aged 23, a homœopathic practitioner of medicine, consulted me in March, 1865. His mother died of consumption. He had had repeated attacks of profuse hæmoptysis, and the signs (which were not noted) showed a considerable affection at the summit of the chest on the left side. I advised a sea voyage. He obtained the situation of surgeon to a Liverpool vessel, and made the voyage there and back. He improved notably during the voyage, and went into a country town in Massachusetts to practise. His cough ceased, and he was in all respects well, gaining in weight and strength, until the spring of 1866. He consulted me again in May of that year; he had recently had several attacks of hæmoptysis, with return of cough and expectoration. There was now dulness on percussion at the summit of the chest on the left side, with weakened vesicular murmur. I advised to repeat the voyage, if the cough continued or the general health declined. Alcoholic stimulants did not affect him favorably. He had no medicinal treatment. The appetite and digestion had been, and were, good. He was accustomed to use the cold sponge bath daily in winter and summer. The only subsequent note of this case is in May, 1871. I then noted that I had recently met him, and that he looked and reported himself well.

Remark.—In this case, as in some other instances among these cases, hæmoptysis took place after recovery, accompanied by a temporary cough, but without the evidence of a recurrence of phthisis. It may be supposed that the hemorrhage in these instances is, in fact, a phthisical manifestation, and is conservative, that is, preventing or being a substitute for a recurrence of the local affection.

Case 33. *A small Pulmonary Affection; well four years after my examination.*—Mr. G., aged 33, provision dealer, and much of the time out of doors, consulted me in October, 1866. There was a family predisposition to phthisis; cough and expectoration had existed for several months. There was dulness at the summit of the chest on the right side, with increase of vocal resonance. The respiratory murmur was notably feeble everywhere. I advised continuance of out-of-door life, and the moderate use of alcoholic stimulants. I did not see this patient afterward, but I have noted in April, 1870, that his brother-in-law, a medical friend of mine, told me that he had removed to Minnesota, and was perfectly well.

Case 34. *Recovery from apparently confirmed and advanced Phthisis; well twelve years afterwards.*—The disease, in this case, occurred in the person of one who is now a distinguished medical practitioner and teacher. I made an examination of the chest in the winter of 1863–64, and found signs which are observed after recovery from phthisis. In this instance only the fact was recorded that the signs existed; they were not noted. I shall introduce the account given to me in his own words: "I never suffered from any pulmonary disease until the year 1859. My tonsils and throat had troubled me very much at times, and I had had both tonsils excised for chronic enlargement. I graduated and commenced practice in the country. Soon after graduation at the close of the year 1855, my strength and vigor increased as the result of an active out-of-door life up to 1858, when was added to my labors the care of a large estate. This, with a large country practice and a malarious climate, caused me to break down. During several months I had repeated attacks of intermittent fever. In May, 1869, I had a slight hæmoptysis. I paid but little attention to this. Half an hour afterward I mounted my horse and rode eight miles, after which I was engaged in business for several hours and then travelled in a railway car two hundred and twenty miles before retiring to bed. I kept my room for two or three days, and resumed my labors as before. During the following summer I had intermittent fever, and in the early part of July I began to cough. During this month I had daily paroxysms of fever, and I lost weight and strength. In the latter part of the month I had hæmoptysis, and raised within twenty-four hours a large quantity of blood, estimated between two and three quarts. I was unable to go out of doors for two months, and the bleeding returned on any exertion. As soon as my strength would permit I went into the western part of New York among the hills, and I remained there with decided benefit until cool weather. Meanwhile my chest was examined by several physicians, and all agreed that there was a tuberculous affection of the left lung. During the following winter I returned to my practice, but consulting my comfort, and I gained constantly until March, when I was summoned in haste to see a sister who was ill in New Jersey, and the journey occupied four days and nights. On my return I began to raise blood more or less daily until I became much reduced, and I again went into western New York with the intention of remaining there during the summer. I did not, however, improve. I had recurring of paroxysms of fever daily, with constant cough and expectoration, occasionally hæmoptysis, and a colliquative diarrhœa. The prognosis of all my medical friends, founded on the symptoms and signs, was very unfavorable. While in this condition an abscess formed posterior to the anus. With the discharge of matter here all my symptoms began to improve. After several weeks I tried to heal the fistula, but fortunately (as I now think) it would not heal. There was no communication of the fistula with the gut, and I soon learned to manage it so that it gave me but little inconvenience. With the commencement of cool weather my improvement was more rapid. In the following spring I raised a small quantity of blood, and this was the last attack of hæmoptysis. The next summer my strength was better than during any summer before since my illness. I spent most of my time out of doors, hunting, fishing, etc. The next winter I resumed practice, and I was better the summer following than during the previous summer. In the winter of 1862–63 I was in full country practice, and never before endured long, hard rides better. I continued in practice until shortly before seeing you in the winter of 1863–64. My health was never better than during the two years preceding this date (July, 1864). I now weigh more than when I had my first attack of hæmoptysis. I took very little medicine during the first year of my illness. I took the hypophosphites for a time without any marked benefit, but I thought that they improved my power of digestion. I changed climate from West to East in summer, and from East to West in winter. I have done more for the improvement in my pulmonary affection through the medium of the stomach, taking good food in liberal allowance and alcoholic stimulants, than by any medicines. I have aimed at regularity in all my habits of life. An important hygienic measure which I have adopted is the daily cold sponge bath. I may add that my food has contained fats in large quantity. My opinion, however, for some time has been, that the most conservative remedy in my case Providence kindly gave me in the form of a fistula in ano."

At the time of writing, Dr. J. was free from cough, and in all respects well. This was in July, 1864. He has remained well up to this date, July, 1874.

Case 35. *A small Pulmonary Affection; well six years after recovery.*—Mr. W., aged about 35, editor, consulted me in December, 1867. His father died with consumption. Cough existed, but its duration prior to my examination is not noted. He had not had hæmoptysis. He was not under his weight of health. His appetite and digestion were good. His editorial duties were very confining and laborious, keeping him up much at late hours in the night. He had had pleurisy three years before on the left side, and this side was slightly contracted. There was dulness on percussion at the summit of the chest on the left side, with broncho-vesicular respiration, and undue transmission of the heart-sounds. No disparity on percussion between the two sides at the base, but the respiratory murmur relatively feeble on the left side. Change of habit of life, securing out-of-door life and recreation, was advised, with no medicine. In June, 1868, he reported absence of cough, and general health good. The physical signs showed less solidification at the left summit. On April, 1870, reported that he continued well. In November, 1870, he had cough for a few weeks. Feebleness of the respiratory murmur at the left summit was now the only sign observed. He has since remained well (June, 1874).

Case 36. *A small Pulmonary Affection; well four years after the date of my first examination.*—Mr. L., aged 30, consulted me first in May, 1868. His habits were sedentary. Both parents were living, but he had lost a sister and an uncle from consumption. He had had three attacks of hæmoptysis, slight, the last having been in 1864. At the present time there was no cough, and his weight was normal. Appetite and digestion were good. There was slight abnormal dulness at the summit of the chest on the right side, with weakened respiratory murmur, increase of vocal resonance and whisper, and undue transmission of the heart-sounds. Advised out-of-door life, generous diet, tonics, and cod-liver oil. In October, 1868, he reported quite well. The signs previously noted were less marked. There was dulness over a circumscribed space between the second and third ribs on the left side, and weakness of the respiratory murmur over the lower lobe of the left lung. The latter was observed at the first examination. Enlargement of a bronchial gland was surmised. In January, 1869, dulness over the circumscribed space just referred to, continued, with relative feebleness of murmur over the lower lobe. At the summit on the left side the murmur was feeble, with some subcrepitant rales. He had no cough, and he maintained the weight of health. Appetite and digestion were good. Advised three months' vacation and a voyage to Europe. In October, 1869, his health was excellent. He had gained in weight; no cough; dulness over the circumscribed space continued, and at the left summit feeble respiratory murmur and subcrepitant rales; vocal resonance greater than on right side. He went to Europe in January, 1869, and returned in three months. In January, 1872, he had no pulmonary symptoms, and reported himself well. Some dulness, as above, and relatively feeble respiratory murmur over left side continued.

Case 37. *A considerable Pulmonary Affection; well twenty-two years after the date of the development of the disease.*—The following account of the case of Mrs. N., aged 42, was noted in July, 1868. Seventeen years prior to this date she had cough, with attacks of hæmoptysis, and was attended by an eminent physician of this city, who informed her that her condition was hopeless. A year afterward she was under the care of the late Dr. Cammann, who pronounced her disease consumption. The cough had persisted, with brief intervals, up to her consulting me four years prior to the date of my first record. In the mean time she had had repeated attacks of hæmoptysis. In 1854 she went to Europe, and returned with improved health. When I first saw her, phthisis was denoted unequivocally, but I did not note the signs. For a year preceding the date of my first record (July, 1868) she had been entirely free from pulmonary symptoms, excepting a slight cough in the morning. In other respects her health had been good. On this date there was depression at the summit of the chest on the right side, with feebleness of the respiratory murmur, and some subcrepitant rales. The resonance of the voice and whisper was not abnormally great. During the four years she saw me at intervals, and was treated with tonics and alcoholic stimulants in small quantity, and generous diet. During this period she repeatedly made journeys into the Western States. She is now (June, 1874) well. When she first came under my observation she was a widow, and she was again married about three years ago.

Case 38. *A small Pulmonary Affection; well eight months after the date of my examination.*—Mr. C., lawyer, about 25 years of age, consulted me in September, 1868, accompanied by his brother, who was in advanced phthisis, and subsequently died of this disease. In the autumn of 1865 and the following winter he took, with his brother, a voyage around Cape Horn. He took cold, as he thought, during the voyage, and had a dry hacking cough. He had also a slight hæmoptysis. The ship sprang a leak, and he worked daily at the pumps. Under this exercise he gained in weight and strength. Afterward, in California, he continued to gain in weight. He returned to his office duties in New York in June, 1867. He was well until the summer of 1868. In August of this year, he had four attacks of what was called congestion of the lungs. They were probably attacks of bronchitis. At the time of my examination his cough was slight. There was slight dulness on percussion at the summit of the chest on the left side, with notably weakened respiratory murmur and crumpling rales. He went to Minnesota, where shortly his cough ceased and he gained in strength. He was constantly in the open air. In June, 1869, I made a second examination and found the same signs as before. His general health was excellent, and he decided to settle in Minnesota permanently.

Case 39. *A small Pulmonary Affection; well six years after my examination.*—Mr. T., aged 23, clerk, parents living and well, had in May, 1868, profuse hæmoptysis, preceded and followed by slight cough and some loss in weight. The summer of this year was passed in the country, and he had gained in weight. He consulted me in October, 1868. The cough was then insignificant; his aspect was healthy; his appetite and digestion were good. There was slight abnormal dulness at the summit of the chest on the right side, with weakened respiratory murmur, increase of vocal resonance and whisper, crackling with inspiration and undue transmission of the heart-sounds. He was living generously, drinking lager beer, and taking half a pint of cream daily. The hypophosphites were prescribed. I did not see this patient afterwards, but I have heard repeatedly of his being well. He relinquished office duties, and became a travelling agent.

Case 40. *A moderate Pulmonary Disease ; Recovery, and recurrence of the disease.*—Mr. P., aged 25, from Quebec, clerk, parents living, consulted me in October, 1869. He had recently had slight hæmoptysis. The appetite and digestion were fair. The aspect was not morbid. There was dulness on percussion at the summit of the chest on the right side, with an abnormal transmission of the heart-sounds. No other signs were noted. In November, 1869, he sailed for Lima, Peru. He called upon me, on his return, in May, 1870. On his voyage to Lima his cough entirely disappeared, and he improved in every way. After reaching Lima his cough returned, and he was advised to go to the mountains. There he was free from cough, and so remained until shortly after his return to New York when he thought that he "took cold." He looked well, and was fifteen pounds heavier than when he sailed for South America. He was enthusiastic in his praise of the mountains of Peru as a place of resort for persons with pulmonary disease, the climate being warm, dry, and uniform. I did not at this visit examine the chest. He consulted me again in December, 1872, stating that his health had been excellent until the autumn of 1871. Since this latter date he had had cough, and hæmoptysis had recurred. He was somewhat emaciated. There was more notable depression at the right summit of the chest in front, with deficient movement, dulness on percussion, bronchophony, and broncho-cavernous respiration. There were moist rales at the left summit. He was on his way to Virginia. Death took place during the winter.

Case 41. *Phthisis for ten years ; Disappearance of cough, and good health five years afterward.*—Dr. G., from Alabama, called upon me with the late Dr. Nott in May, 1870. Both parents and a sister had died with phthisis. He became affected with the disease shortly after receiving his medical degree. He was advised by Dr. Nott to go into the country, and practise riding on horseback. For ten years he had cough, with at times night perspirations, etc. For the preceding five years he had been free from cough, and had enjoyed good health. His weight was twenty pounds more than ever before in his life. His only ailment was some want of breath on active exercise. He had a large city practice; also teaching medicine, and directing his attention especially to diseases of the chest. Everywhere over the left side of the chest there was notable dulness on percussion. In the infra-clavicular region the respiration was vesicular. Over the middle third the respiration was broncho-vesicular, and the voice broncophonic.

Case 42. *A small Pulmonary Affection; well a year after the date of my examination.*—Rev. Mr. P., aged 50, consulted me in November, 1872. Four weeks before seeing me he had hæmoptysis, and on two consecutive days there were three attacks, one of which was profuse. He had been steadily engaged in his clerical duties for twenty-two years. There was dulness on percussion at the summit of the chest on the right side, with feebleness and broncho-vesicular character of the respiration. He went to Europe, visiting Mentone and travelling in Egypt, and returned in the following spring free from cough and in all respects nearly well. In December, 1873, he was still free from cough, and his weight was greater than ever before. He had been actively engaged in his professional duties since his return. He consulted me at this time with reference to a perineal fistula which had existed about a month. He was desirous of an operation for its cure, and my advice was adverse to surgical interference.

This case was observed after the abstracts of the cases in this collection were made. He consulted me again in July, 1874, for the same object and received the same advice.

Case 43. *A considerable Pulmonary Affection; well five and a half years after my first examination.*—Miss T., aged 19, came under my observation in December, 1850. Two years prior to this date she had hæmoptysis, which was not preceded nor immediately followed by cough. In the spring of 1849 she had two attacks of hemorrhage which were preceded and followed by cough with expectoration. Another attack occurred in the autumn of 1849. She was under the care of a botanic practitioner for eight or nine months following the first hæmoptysis. In the summer of 1850, she was at a water cure for five weeks, and she continued the use of the wet pack, hip baths, etc., for three months afterward. The menses had been absent since June. At the time of my first examination the pulse was

120, and the respirations were 25. The following signs were noted: marked dulness on percussion at the summit on the left side, with bronchial breathing, bronchophony, and moist rales. She came under my observation again in January, 1852. She had progressively improved in strength during the year which had elapsed, and had gained considerably in weight. She had a healthy appearance. The cough and expectoration had steadily diminished, and at this time these symptoms were slight. I had prescribed a year before the cod-liver oil which she had taken during most of the intervening period; the whole quantity taken amounted to three gallons. She had lived in the country as housemaid, and was more or less out of doors. The appetite and digestion were good. The menses had recently returned. The pulse was 80 and the respirations 20 per minute. There was notable depression of the left summit in front, with marked dulness on percussion, feeble respiration, and increase of vocal resonance, but the voice not bronchophonic. In July, 1856, her aspect was healthy, and she was entirely free from any symptoms of pulmonary disease. When she had the first hemorrhage she was engaged in weaving, and prior to this she was a school teacher. These sedentary occupations were exchanged for domestic duties and considerable out-of-door life.

Case 44. *A considerable Pulmonary Affection; well five years after my examination; recurrence of phthisis ending fatally.*—Miss D., aged 18, was examined by me in February, 1858. She had a slight hæmoptysis in the summer of 1857 while apparently in perfect health. A few weeks afterward there was a second hemorrhage, and she now began to cough, to lose weight, and she became pallid. In the autumn, however, she regained her usual weight and healthy appearance, and she seemed perfectly well. A few weeks prior to my examination another hemorrhage had occurred, the cough returned, she lost in weight, and was deficient in breath on exercise. There was marked dulness on percussion at the summit of the chest on the left side, with notable feebleness of respiration. Whiskey, tonic remedies, generous diet, and out-of-door life were advised. In 1853, her father, an eminent practitioner of medicine, wrote to me that she was well and had been so for the past year. He stated that when she began to take whiskey her pulse was about 130 per minute; she was much emaciated; she had hectic paroxysms with profuse sweating, and raised at least half a pint of purulent matter every twenty-four hours. She was subject to the frequent occurrence of diarrhœa. He began by giving her half an ounce of rye whiskey hourly, and this, with one-sixteenth of a grain of the sulphate of morphia every four hours, constituted the treatment. At the end of about two weeks there was evident improvement. He increased the amount of whiskey, and encouraged her to eat anything which she desired. At the end of two months she was taking a pint of whiskey daily, and she continued to take this quantity for two years. At the end of this period she had regained her usual strength and weight, and the menses returned, having been suppressed for nearly three years. The whiskey, now, for the first time, occasioned excitement, and the quantity was rapidly reduced to half an ounce three times daily. This quantity was in a short time discontinued, and she had taken none for the preceding year. She was unable to go out of doors for four months after commencing the use of the whiskey. After this she was in the open air much of the time. This patient subsequently had recurrence of phthisis, and died with the disease.

The foregoing cases substantiate the fact that, in a certain proportion of cases, phthisis ends in recovery. In what proportion has the disease this ending? In 670 recorded cases, the recoveries are 44. It would not, however, be fair to conclude the ratio of recoveries to be about 1 to 16, since, of between four and five hundred of the cases, the histories are incomplete as regards the termination. Nor would it be proper to consider the ratio as fairly represented by the proportion of recoveries in the cases of which the histories do embrace the termination. The number of cases I noted to have ended fatally is 279. This would make the ratio 1 to a fraction over 6.

Of the cases, the terminations of which are not noted, doubtless the vast majority ended fatally, for instances in which recovery took place would not be likely to remain unknown. On the other hand, pains were taken especially to note cases of recovery, and hence, the ratio of about 1 to 6 is undoubtedly too large. To what extent the rate of mortality is affected by measures of treatment, is a question of much importance. This question, however, will come up more appropriately in the next chapter.

1. As regards the amount of disease, I have arranged the cases in five classes, designated by the following terms: Small, moderate, considerable, large, and advanced. In the larger number of the cases the affection was small, that is, the amount of solidification, as represented by physical signs, was slight. Of the 44 cases, 25 are in this class. In 4 cases the affection was considered as moderate. In 10 cases the signs showed a considerable affection. The classes denominated large and advanced, embrace each but a single case. In the case of advanced phthisis (No. 34), the diagnosis was retrospective, and the evidence of the disease having reached the cavernous stage was based on the history, not on the physical signs. The term advanced is intended to relate especially to the formation of cavities. It so happens that in none of these 44 cases were the cavernous signs noted; yet, it is quite certain, from the symptomatic history, and the diminished volume of lung as shown by signs after recovery, that in several of the cases cavities had been formed. The facts given in cases Nos. 37, 41, and 43, warrant this conclusion. The statement that cavities do not preclude recovery has no novelty, for morbid anatomy has abundantly demonstrated the fact. It is, however, undoubtedly true that smallness of the affection is an important element in a favorable prognosis. This is illustrated by the number of those of my cases ending in recovery in which the affection was small. And, it is to be remarked, the smallness relates, not only to the absence of cavities, but to the degree and extent of the solidification, that is, to the quantity of intra-vesicular exudation. In fact, the affection may be circumscribed within a small space, and cavities may be produced within this space, without the evidence of any further extension of the disease. Such cases are not very rare, and they will be found especially among those in which the affection is arrested, complete recovery not taking place. Of the extreme of the amount of the damage of lung incident to cavities, compatible with recovery, that is, with complete cicatrization, these cases do not afford illustrations.

2. What import in prognosis has age? The ages were noted in 36 cases. In 1 case the age was nineteen years. This was the minimum; but it is to be borne in mind that my collection

of cases does not embrace children. In 2 cases the age was nineteen years. In 15 cases the ages were between twenty and twenty-five years inclusive. In 8 cases the ages were over twenty-five and thirty years or under. In 4 cases the ages were thirty-five or under, and over thirty years. In 2 cases the ages were forty or under, and over thirty-five years; and in 3 cases the ages were fifty or under, and over forty years. Thus in 26 of 36 cases the ages were under thirty years. This is in accordance with the greater liability to phthisis under thirty years of age. So far as these statistics go, they do not show that the fact of a patient being over thirty is of importance as respects the prospect of recovery. In fact, the analysis fails to show any import of age in prognosis.

3. Has sex any influence in determining recovery? Of the 44 cases, 34 were males and 10 were females. But of the 670 cases (the addition of a case of recovery compensating for a single case among the whole number in which the sex was not noted), 506 were males and 164 females; so that, the proportion of males to females in the whole number of cases is very nearly the same as the proportion in the cases which ended in recovery. The result of the analysis is, therefore, negative in respect of any influence pertaining to sex.

4. Family predisposition might rationally be supposed to have considerable weight in prognosis. The existence or absence of family predisposition was noted in 24 cases. Of these cases, a family predisposition existed in 10, and was absent in 14 cases. The number of cases is not large; but, as far as they warrant any conclusion, it is, that the absence of family predisposition is not of much importance as a ground for a favorable prognosis. It is worthy of note that in 2 cases, the patients being sisters (Nos. 20 and 23), both their parents had had phthisis, and they had lost by this disease three sisters and two brothers, these two sisters being the only surviving members of the family. On rational grounds, a very strong family predisposition would be supposed to exist in these two cases. There has been, as yet, no recurrence of phthisis in either case, sixteen years in one, and twelve years in the other case, having elapsed since recovering from the disease. These cases are of value as showing that the prognosis need not necessarily be unfavorable under circumstances which appear to denote a remarkable family predisposi-

tion. As a ground for proper encouragement, the physician will do well to bear this fact in mind.

5. The influence of hæmoptysis on recovery was studied incidentally in the preceding chapter (*vide* page 106). The cases the histories of which contained definite information as to either the occurrence or non-occurrence of this event (179) were analyzed with reference to the number of recoveries in each group of cases. Of the group of cases (98) in which hæmoptysis occurred, 19, and of the group in which hæmoptysis did not occur (81), 12, ended in recovery. This comparison indicates some favorable influence of hæmoptysis, the difference being as 19 and a fraction per cent., to 14 and a fraction per cent. These figures do not show great influence. They show very decidedly, however, that the influence is not unfavorable. We may here consider this inquiry in another aspect, namely, as regards the number of the cases ending in recovery in which hæmoptysis was more or less prominent. Of the 44 cases, in 8 the occurrence of hæmoptysis was not noted, and in 5 it was noted that this event had not occurred. Probably it did not occur in most, if not in all, the cases in which its occurrence was not noted. It occurred in 31 of the 44 cases, that is, in a ratio of about 70½ per cent. Now, taking all the cases in which either the occurrence or non-occurrence of hæmoptysis was noted, the ratio of its occurrence is about 54¾ per cent. Thus, in this aspect, not an unfavorable, but, on the other hand, a certain amount of favorable influence is apparent.

The result of an examination of the cases with reference to the repetition of the hemorrhage, and its profuseness or otherwise, is of interest. In seven of the cases in which hæmoptysis occurred, the histories do not contain definite information on these points. Of the remaining 24 cases, in 8 (⅓) the hemorrhage occurred repeatedly and was profuse. The hemorrhage occurred repeatedly, the facts respecting profuseness not having been noted, in 7 (nearly ⅓) cases. It was noted as profuse, the facts with respect to recurrence not noted, in 4 (⅙) cases. It was noted as small in 5 (nearly ⅕) cases. It thus appears that repetitions and profuseness of the hæmoptysis are not unfavorable circumstances as elements in prognosis.

6. Chronic laryngitis existed in two of the cases ending in recovery. In one case huskiness of voice has remained now

more than fifteen years after recovery; and in the other case the condition of the voice after recovery was not ascertained.

7. Pleurisy, with effusion, preceded the development of phthisis in two of the cases; in one case having occurred three years, and in the other case one year prior to the latter disease, and it occurred as an intercurrent affection in one case.

8. Perineal fistula occurred in one of the cases, and was coincident with the improvement which was progressive until recovery. (No. 34.) In another case it occurred after recovery from the pulmonary affection. (No. 42.)

9. In many of the cases ending in recovery the histories are not sufficiently full for analysis with respect to symptoms, such as appetite and digestion, loss in weight, muscular debility, pulse, temperature of the body, night sweating, etc. As regards these, I must content myself with some general statements. In most of the cases the conditions of health, irrespective of the pulmonary affection, were not greatly impaired. I refer to conditions represented by symptoms pertaining to the digestive system, nutrition, muscular strength, circulation, temperature, etc. In other words, the system was notably tolerant of the pulmonary affection in most of the cases ending in recovery. Cases No. 7, 9, 34, and 37 are those in which the conditions of health, aside from the lungs, were most affected. Perhaps it is allowable to state, as a rule, that the circumstances denoting good tolerance are of more importance in their bearing on prognosis than the amount of the pulmonary affection, albeit, as has been seen, the latter is in this relation of much importance. In looking over the names in the list of recoveries, I am impressed with the force of this statement, namely, most patients who recover from phthisis are persons of resolution and perseverance; persons who appreciate the nature of the disease, and are determined to overcome it. The disease, as is well known, is apt to induce either delusion concerning danger, or a state of passive acquiescence therein. The will may become here, as in some other diseases, an efficient agent in promoting recovery, and it is, therefore, an important element in prognosis. So far as the mind is concerned, the most favorable condition is that in which the patient appreciates fully the situation, and is resolved to spare no efforts in becoming master of it, having much faith in his ability to succeed.

10. The recurrence of phthisis is an interesting point of inquiry. A recovery was noted in six of the cases, and in one of these cases there was a second recurrence, recovery from the latter taking place. The intervals between recovery and the recurrence, exclusive of the case in which there was a second recurrence (No. 17), were as follows: Over 6 years, over 5 years, 5 years, 3½ years, and 1½ years. In all these five cases the recurrent disease proved fatal. It is probable that the number of cases in which recurrence was noted does not comprise all the instances in which it either has already occurred, or in which it will hereafter occur. There may have been a recurrence in some cases which have been lost sight of, and some persons who are known to be now well may again have the disease. With reference to this point, it is of interest to review the length of time noted as having elapsed from either the recovery or the date of my examination in the cases exclusive of those in which a recurrence enters into the histories. In 19 of the cases, dating from either my examination or the development of the disease (the duration of the latter not being determinable), the periods which had elapsed were as follows: Six months, 2 cases; eight months, 1 case; one year, 4 cases; one year and seven months, 1 case; two years, 1 case; three years, 1 case; four years, 3 cases; five years and six months, 1 case; six years, 2 cases; seven years, 1 case; ten years, 1 case; and twenty-two years, 1 case. In 19 cases, dating from the time of recovery, the periods were as follows: Six months, 1 case; one year, two cases; two years, 1 case; three years, 1 case; four years, 2 cases; five years, 3 cases; six years, 2 cases; eight years, 1 case; nine years, 1 case; ten years, 2 cases; twelve years, 1 case; thirteen years, 1 case; fourteen years, 1 case; and twenty-seven years, 1 case.

The foregoing analyses show that in at least a little over one-seventh of the cases of phthisis ending in recovery the disease recurs after periods varying from one and a half to six years. This fact enforces the importance of such measures of hygienic management as may be deemed judicious, with a view to prevent recurrence; and, moreover, it teaches that these measures should be persisted in, not for months only, but for a series of years. For example, if there be reason to believe that a change of climate has led to recovery, the change should be permanent. So, also, as regards change of occupation, and of habits of life in any particulars of importance. On the other hand, the periods which in several of the cases had elapsed without recurrence, furnish ground in individual cases for encouragement in hoping that it will not occur. It is a noteworthy fact that, with the single exception in which the disease recurred twice, the recurrent disease proved fatal. This fact renders the prognosis extremely unfavorable whenever the disease recurs.

In two cases ending in recovery, the menses, which had been suppressed, in one case for two, and in the other case for three years, returned after the cessation of the pulmonary symptoms (Cases No. 43 and No. 44). This fact has an important bearing on prognosis. It shows that the suppression of the menses subsequent to the development of phthisis, is not necessarily of unfavorable omen.

Cases of Arrested or Non-progressive Phthisis.

This class embraces cases, the histories of which show an arrest or the non-progress of the disease, but not complete recovery. Phthisis, in the majority of cases, marches onward steadily until life is destroyed. In a minority of cases it ceases to progress, and restorative processes follow which end in recovery. The disease is said to be retrogressive. Now, in a certain proportion of cases, the progress of the disease ceases, and it pursues a retrogressive course approximating more or less closely to recovery. The recovery is not complete, as is shown by the persistence of cough and expectoration. It is an interesting inquiry, what are the local anatomical conditions in these cases? There may be a cavity or cavities not entirely cicatrized, or there may be circumscribed interstitial pneumonia, with dilatation of bronchial tubes; but it is foreign to my present studies to enter into this inquiry. I shall study these cases from a clinical point of view only; and, so studied, they are scarcely less valuable than the cases of recovery from phthisis. Arrested, non-progressive phthisis, although recovery does not take place, is not incompatible with fair or even good general health and long life. That recovery does not take place is due to the continuance of local conditions or lesions which cannot be removed. These may be slight, or almost, if not quite innocuous. This is the termination, therefore, to be desired and labored for next to complete recovery. The circumstances or agencies, internal or external, which are instrumental in effecting recovery from phthisis, are, in fact, those which lead to an arrest or the non-progress of the disease. This is the primary objective point of our hopes, and of measures of management. After this point has been reached, then the ulterior object is, if possible, recovery. If the latter object be unattainable, as close an approximation thereto as possible is the true end to be hoped and striven for. This end, in reality, has to do, not with existing phthisis, if the disease have been arrested, but with the local effects of a past disease.

Considering the importance of the class of cases to be now studied, I shall give, condensed as much as possible, abstracts of them severally.

Case 1. *Fair health twenty-five years after the development of phthisis.*—Rev. Mr. C., aged 35, consulted me in December, 1851. He had been a dyspeptic for fifteen years. Slight cough and expectoration had existed for several years. His habits of life were extremely sedentary. He had recently had a slight hæmoptysis. There was dulness on percussion at the summit of the chest on the right side in front, and on the left side behind, with flattening at the summit, diminished superior costal movement, and increase of vocal resonance on the right side; crackling with respiration existed at the summit on both sides. Cod-liver oil, a generous diet, the moderate use of alcoholic stimulants, and more out-of-door life, were ordered. In July, 1855, the same signs were noted, with the absence of crackling. I have not seen this patient since, but in March, 1874, his brother informed me that he was in fair health, but still a dyspeptic, and having some cough. He had had hæmoptysis repeatedly since he was under my observation.

Case 2. *Fair health nineteen years after the development of phthisis.*—Mrs. O., aged 45, came under my observation in February, 1855. There was no hereditary predisposition to phthisis. She had good health up to twenty-seven years of age. During the eighteen years since this age she had been subject to attacks of hæmoptysis, from eight to ten annually. Generally the hemorrhage was slight, but sometimes profuse. She had never been confined to the bed except when the hemorrhage was profuse, or from attacks of pleurisy. She had been exempt from the latter for the preceding seven years. For the last four years the menses had occurred irregularly; previous to this time they were regular. More or less cough, with expectoration, had existed since the first hemorrhage, there having been none previously. For a long time these symptoms had been stationary, or, if there had been any change, it was in the direction of improvement. Her weight was within a few pounds of that previous to the first hemorrhage. She had gained in this respect during the last four years. The appetite and digestion were generally good. Twelve years before the date of my record of the case, she had had night sweating, and had kept the house during the winter. She had had very little medicinal treatment, never having taken remedies except in attacks of pleurisy or when the hemorrhage was profuse. I found dulness on percussion at the summit of the chest on the right side, with feeble respiratory murmur, increase of vocal resonance, and undue transmission of the heart-sounds. She considered herself well, having the charge of a family with six boarders. She had been married twenty-one years, and had never had children. The subsequent history is unknown.

Case 3. *Complete health, twenty-seven years after the development of phthisis.*—Mr. O., husband of No. 2, aged 51, came under my observation at the same time. There was no hereditary predisposition. Hæmoptysis occurred twenty-seven years prior to 1855. He had previously for many years been a dyspeptic. He had had repeatedly recurrence of the hemorrhage, which had never been profuse. The last recurrence was in the winter of 1854–55. Cough and expectoration had existed since the first hemorrhage, and for several years these symptoms had been stationary. He had always kept about, and engaged in business, having been an apothecary, a drygoods dealer, and a wholesale grocer in succession. For many years he had taken no medicine, and had had no medical advice. The appetite and digestion were good. The only physical sign noted in this case is dulness on percussion at the summit of the chest on the right side. The subsequent history of this case is unknown.

Case 4. *Patient nearly free from cough and the general health good six months after the development of phthisis.*—Mr. P., aged 31, ship carpenter, came under my observation in September, 1856. Four years prior to this date, he had hæmoptysis which occurred on the day after his having received a severe injury of the chest at sea. From his account of the symptoms at that time, and the contraction of the right side of the chest, it was inferred that the injury was followed by pleurisy with effusion. Subsequently he had recurrence of the hæmoptysis twice or thrice, but no cough until two months before consulting me. During this period the cough had progressively increased, and he now expectorated solid sputa in considerable quantity. Diarrhœa had existed for several weeks. He had occasional night sweating. There was notable dulness at the summit of the chest on the right side, with prolonged expiration and absence of inspiratory sound, increase of vocal resonance and of bronchial whisper. The right side of the chest was considerably contracted as it is after chronic pleurisy. He was not weak enough to feel obliged to relinquish work entirely. Cod-liver oil and generous diet were advised, with continuance of work to the extent of his ability to bear it well. For the diarrhœa an astringent mixture was prescribed. October 13, he reported better. The diarrhœa was relieved and there was less cough and expectoration. He had not continued the cod-liver oil, as it seemed to increase the diarrhœa. December 23, he had no habitual cough; he had gained considerably in weight; his aspect was healthy, and he was competent to do a full amount of work. He had taken the cod-liver oil until within the last fortnight, discontinuing it because it seemed to occasion looseness of the bowels. There is no further record of this case.

Case 5. *Fair health five years after the development of phthisis.*—Miss E., seamstress, aged 21, began to cough in January, 1857. There was no family predisposition to phthisis in this case. She came under my observation in June, 1857. Prior to this date she had had no medical advice, but she had taken continuously cod-liver oil. On that date I found the physical signs of phthisis, but they were not noted. During the summer of 1857, she performed the duties of a steamboat cabin maid. She was advised to continue the cod-liver oil, and to take whiskey. In July, 1858, she had gained as regards appearance of health, and in strength. The cough and expectoration had lessened, and were now slight. She had occasional night sweating. She menstruated regularly. There was marked depression, and diminished mobility at the summit of the chest on the right side, with dulness on percussion, broncho-vesicular respiration, bronchophonic whisper, and undue transmission of the heart sounds. During this summer she was much out of doors. In March, 1859, she presented an appearance of perfect health. She was stout and had a ruddy complexion. She was almost entirely free from cough. She was now doing the work of a housemaid. There was still notable depression at the right summit, with dulness on percussion, feebleness of the respiratory murmur, intense vocal resonance, and subcrepitant rales. She had taken cod-liver oil and whiskey steadily during the winter. In March, 1862, I was informed by a person who was in the habit of seeing her that she was in fair health. There is no further record of the case.

Case 6. *Almost entire disappearance of pulmonary symptoms, and good health fourteen months after the development of phthisis.*—Miss H., teacher in a public school, aged 19, came under my observation in August, 1858. Her mother died with consumption. Several of her mother's family had had the disease. Cough, followed by expectoration, had existed for a year. She now raised, according to her estimate, half a pint daily. The appetite and digestion were good. She had not had hæmoptysis. She was about fifteen pounds under her weight in health. The menses were scanty and irregular. He duties confined her six hours daily to the school-room, and she walked to and from the school-house, a distance of three miles. There was dulness on percussion at the summit of the chest on the left side, especially over the scapula, with broncho-vesicular respiration. She was advised to take cod-liver oil and whiskey, and to be in the open air as much as possible. She was now relieved of her duties at school. In September, 1858, she reported that she had progressively improved, and that she was almost entirely free from cough. She resumed in this month her duties as a teacher. In October, 1858, her aspect was greatly improved. She considered herself quite well. She had gained in weight. She had taken the cod-liver oil and whiskey up to this time. There is no further record of this case.

Case 7. *Good general health three and a quarter years after the development of phthisis.*—Dr. H., aged 21, having graduated in medicine at the New Orleans School of Medicine in 1858–59, returned to attend the course in 1859–60, and consulted me in January, 1860. Cough had existed since December, 1858. He had recently had hæmoptysis. He had yellow fever in 1859, and during the past ten months frequent attacks of intermittent fever. He had now an abundant expectoration, and he was notably pallid. There was dulness on percussion at the right summit of the chest, with broncho-vesicular, approximating to bronchial, respiration, increased vocal resonance and whisper, and undue transmission of the heart-sounds. At the left summit there was interrupted respiration. The appetite and digestion were good. He had not, as yet, taken either cod-liver oil or alcoholic stimulants. I advised their use, with quinia and out-of-door life. He returned home on the coast not far from New Orleans. In January, 1861, he came to New Orleans to attend the portion then remainder of the lecture session. He had improved so much that I did not recognize him. He had gained in weight twenty pounds. The cough and expectoration were now slight. He had lived out of doors, having been engaged in practice and often exposed to rain. He had taken six ounces of whiskey daily up to the past five weeks, with the exception of two weeks during which time he discontinued it, but resumed it because he thought he was not as well without it. For the past five weeks he had taken no stimulant, thinking that he could do without it. He had no difficulty in quitting the use of it, having acquired no love of it. In March, 1861, I noted the physical signs as follows: Dulness still at summit on the right side, but less than at the first examination; the respiration still broncho-vesicular, but further removed from the bronchial. At this date he returned to practice, having attended lectures for two months, and during this time he took no alcoholic stimulants. There is no further record of this case.

Case 8. *Good health and absence of pulmonary symptoms fourteen years after the development of phthisis; Recurrence and recovery.*—Dr. H., parents living and well, but two maternal uncles having died in their early manhood with consumption, was examined by me in June, 1860. I recorded only the fact that I found signs denoting arrested phthisis. At my request he gave me a written account of his case, of which the following is an abstract: In the winter of 1846, he had a severe cough which lasted until spring. He then commenced the study of medicine. In the summer following he suffered from a dissecting wound. Before he had recovered from this, the cough returned. Soon afterward he had hæmoptysis, which recurred frequently up to July, 1851. He became emaciated and had night sweating. In June, 1851, he removed to the summit of the Alleghany Mountains, in Columbia County, Pennsylvania. He spent much of the time in the open air on horseback, living generously, and taking whiskey moderately. He had recurrence of hæmoptysis only twice afterward, and he gained rapidly in strength. He suffered from bleeding piles, which were removed in 1856. His weight increased from 129 to 183 pounds. After apparent recovery, having been upset in a sailing boat and remaining wet for several hours, he raised a little blood and had a troublesome cough for several months, during which another slight hemorrhage occurred. At the date of his communication, namely, August, 1860, he was perfectly well, being entirely free from cough and able to undergo considerable exertion. The only inconvenience was from some want of breath on active exercise. At this time he was on active duty as surgeon of cavalry.

Remarks.—This case is, in fact, one of recovery from phthisis, and is in the present group of cases from inadvertency. This, however, is not of much consequence, inasmuch as this series of cases is nearly, if not quite as valuable, with reference to practical deductions, as the cases in which recovery was complete. The history of this case appears to show a recurrence of phthisis; and, in this point of view, it is noteworthy as a case of recovery from the recurring disease, an ending which, as there is reason to think, is exceptional (*vide* page 218).

Case 9. *Fair general health seven years after the development of phthisis.*—P. C., aged 27, temperate, born in Ireland, former occupation that of a hawker, was examined by me in 1862. I noted only that I found signs of phthisis. At my request he furnished me with a written statement of his case, of which the following is an abstract: Cough with expectoration began in March, 1859. He was then in Boston, Mass. He came to New York in August, 1859. In November of this year he had profuse hæmoptysis. He raised blood in the following April in large quantity. Meanwhile, the cough continued, and the expectoration was large. During the nine weeks following April, 1859, he had frequent recurrence of hæmoptysis—he thinks the attacks numbered as many as thirty. From this time he began to improve, and at the time of my examination (1862) he had gained in strength and his general aspect was healthy. He was at this time and afterward employed as clerk successively at the Bellevue and Charity hospitals. In November, 1866, I noted that he appeared and reported himself here, performing, at that time, active duties as a clerk at Charity Hospital. There is no further record of this case.

Case 10. *Fair general health, with cavity, four years after the development of phthisis.*—G. T., aged 27, carpenter, came under my observation in March, 1862, at the New York Demilt Dispensary. He had been a patient at this dispensary for the preceding two years. During this period there had been progressive improvement as regards local symptoms and general health. His aspect was not morbid, and he had considerable muscular strength, although he was not strong enough to work at his calling. Cough had existed for about four years. There was cracked metal resonance at the summit of the chest on the right side, with well-marked cavernous respiration and whisper. He had taken steadily during the two years either cod-liver oil, or the head whale oil under the direction of the late Dr. Cammann.

Remarks.—This case represents a class of cases, several examples of which have fallen under my observation, namely, cavity or cavities existing without much cough and expectoration, and with fair or even good general health. In these cases there are no signs of recent exudation, and the cavities are, in fact, the sequels of phthisis. I have known laboring persons to work as usual with well-marked cavernous signs. The cavities, under such circumstances, may be nearly, or quite, innocuous.

Case 11. *Fair health fifteen years after the development of phthisis.*—Judge R., aged 48, was examined by me in June, 1863. Four years prior to this date he had two attacks of hæmoptysis, and he had not, in the mean time, been free from cough. The cough, however, had always been slight, except when increased at times by "taking cold." There was dulness on percussion at the summit of the chest on the right side, and in the upper scapular region on the left side. At the right summit the respiratory murmur was relatively weak and attended with crumpling rale. There was increase of vocal resonance on this side and of whisper, together with an abnormal transmission of the heart-sounds. At this time, as previously since the commencement of the cough, he was engaged in laborious duties as a lawyer and politician. In April, 1870, I noticed that he was not vigorous, but still actively engaged in professional business. He has since (1874) remained in fair health.[1]

Case 12. *Good health over eleven years after the development of phthisis.*—Dr. T., aged about 27, was examined by me in October, 1863. His father died in early life with consumption. Cough with small expectoration had existed for some time, the duration not having been noted. He was pretty actively engaged in the practice of medicine. There was dulness on percussion at the summit of the chest on the right side, with broncho-vesicular and interrupted respiration. The heart-sounds were unduly transmitted. In July, 1864, the same signs were found, but somewhat less marked. There is no further record, but two years prior to the present date (July, 1874) his health appeared to be good. He continued in practice, and thought that he derived benefit from the moderate use of alcoholic stimulants.

Case 13. *Fair health six years after the development of phthisis.*—Mr. M., aged about 25, was examined by me in January, 1864. Cough had existed for several weeks. There was marked dulness on percussion at the summit of the chest on the left side, with cracked metal resonance, bronchial respiration and bronchophony. A pretty loud systolic murmur had its maximum of intensity at the apex of the heart, the organ being but little, if at all, enlarged. The patient was not confined to the bed, and her aspect was not notably morbid. In October, 1865, I noted that this patient had gone to Mentone and was under the care of Dr. Henry Bennett. In August, 1860, the late Prof. Elliot, in consultation with whom I had seen the patient, informed me that she returned from Mentone much improved, and that she was in fair health. There is no further record of the case.

Case 14. *Fair health twelve years after the development of phthisis.*—Mrs. S., aged about 30, came under my observation in December, 1863. Her father had had cough for many years, and died with consumption at the age of 60. She had lost a sister with this disease, and a sister now living is considered as having it. Hæmoptysis had occurred in January, 1863, preceded by a cough which had existed since April, 1862. There were two or three slight attacks of hæmoptysis during the summer of 1863. During the winter of 1862–63, she lived in Boston, Mass., and kept the house by the advice of a homœopathic practitioner, who endeavored to induce her to keep the bed. She had passed the summer of 1863 in Minnesota. On my examination in December, 1863, I found the signs of phthisis, but I did not note them. She was then confining herself within doors. By my advice she was taken out to drive, and after this date she continued to go out daily. She also took cod-liver oil. In March, 1864, I noted that she had much improved. The following signs were now recorded: Notable depression and diminished motion at the summit of the chest on the left side; marked dulness on percussion in this situation, with a feeble, low inspiration, the expiration being high in pitch; whispering bronchophony, and undue transmission of the heart-sounds. She was much under her average weight of health. In April, 1864, I noted that the improvement had been progressive. She had been out of doors five or six hours daily. She had taken the cod-liver oil, and also whiskey steadily. July, 1864, I noted continued improvement. She had gained much in weight. This summer was passed in Orange, New Jersey, and in the White Mountains. She continued to take the cod-liver oil, and about half a pint of whiskey daily. In October, 1865, I noted that her aspect was healthy, and that she retained her increased weight. The preceding summer was passed in Orange. She had still some cough. The quantity of whiskey taken daily had been diminished. December, 1866, I noted that during the winter of 1865–66, she had various neuropathic ailments, and was but little out of doors. She had still some cough and expectoration. She continued to take about six ounces of whiskey daily. Early in the summer of 1866, I advised to discontinue the whiskey, the use of which had become a hardship. She passed this summer at the White Mountains, being much of the time in the open air. In February, 1869, I noted that she had been in good health, with the exception of some cough and expectoration, and the recurrence from time to time of hysterical ailments. It was noted also that at the left summit there was depression, with diminished motion and a feeble respiratory murmur. In December, 1869, I noted that she passed the preceding summer at the White Mountains and the Adirondacks. During the winter and spring of 1870, there was an increase of the cough and expectoration, with failure in general health. For a time she resumed the use of whiskey, and as much out-of-door life as practicable, with benefit. At the present time (August, 1874), she has fair health, with persistence of the cough and expectoration.

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[1] Death has taken place from phthisis within a few months. Sept. 1875.

Case 15. *Fair health twenty-four years after the development of phthisis.*—Mr. N., aged 49, was examined by me in January, 1865. Cough had existed for twenty-four years. Hæmoptysis occurred with the commencement of cough, and he had had as many as twenty attacks of bronchial hemorrhage. He had passed several winters in the West India Islands. He had taken but little medicine. Cod-liver oil and alcoholic stimulants had been tried, but they did not seem to agree with him. The cough and expectoration were now slight. He was deficient in breath on exercise. His appetite and digestion were tolerably good, as he was in fair health. There was no distinct disparity on percussion between the two sides of the chest, nor as regards vocal resonance. There were subcrepitant rales at the summit on both sides. He had been considered to have phthisis by Prof. A. Clark and Dr. C. J. B. Williams. I noted in April, 1870, that he was living and in fair health. He died in December, 1872, the immediate cause of death being some intestinal affection. He was not under my observation after 1865.

Case 16. *Good health eight years after the development of phthisis*—Mrs. N., aged about 25, consulted me first in May, 1865. Cough had then existed for several months. She had had hæmoptysis once. She had lost a little in weight, and her complexion was pallid. There was want of breath on exercise. The appetite and digestion were fair. At the summit of the chest on the left side, in front, the resonance on percussion was vesiculo-tympanitic, with dulness on the posterior aspect. The respiration was broncho-vesicular. She was advised to take quinia and iron; to live out of doors as much as possible; to adopt a generous diet, and to use alcoholic stimulants moderately. In November, 1865, there was no evidence of any increase of the pulmonary affection, and her general condition was improved. In January, 1866, I noted that there had been a steady gain in weight and strength. The cough and expectoration were slight. She sailed for Europe in this month, and returned in July, 1866. She had continued to improve, and excepting a slight cough, she seemed to be quite well. At the summit of the chest on the left side, the resonance on percussion had a slightly cracked metal intonation, and the respiratory murmur was very feeble. Open air, good diet, and stimulants very moderately had constituted the treatment. In January, 1867, I noted that her health was excellent with the exception of some cough and expectoration. In November, 1867, I noted the same. She had passed several weeks on the sea-shore, and during this time the cough and expectoration were diminished. At the left summit and everywhere over this side, the respiratory murmur was relatively feeble. There were some subcrepitant rales at the summit. In January, 1869, her aspect was healthy, and her weight nine pounds more than when she first consulted me. She had still some cough and expectoration. She has not consulted me since the last date, but during the summer of 1873 I met her casually; she presented the appearance of health, but I did not inquire respecting the pulmonary symptoms.

Case 17. *Good general health seven years after the development of phthisis.*—This case has been already given to illustrate the occurrence of an intercurrent, circumscribed, completely resolving pneumonia (*vide* page 139). The patient, Mr. B., aged about thirty, in May, 1866, had considerable solidification of the right lung at the summit. In a few weeks this disappeared, leaving only slight dulness on percussion, with feebleness of the respiratory murmur and increase of vocal resonance. He came under my observation seven years afterward. He had then signs showing a moderate tuberculous affection at the apex of the right lung. Meanwhile he had had good health excepting a persistent cough with some expectoration. At this time he was not under his habitual weight, and he had his usual muscular strength.

Case 18. *Good health five years after the development of phthisis.*—Rev. Mr. M. consulted me first in October, 1865. This was shortly after a profuse bronchial hemorrhage. He had had several attacks of hæmoptysis previously. The signs of phthisis were unequivocal, but they were not noted. He went to Europe and spent the winter and spring months mostly at Nice. He took no remedies. He returned home in June, and his general health was then good. He had slight cough and expectoration. He resumed his clerical duties, and held his own during the summer. In November, 1866, he thought that he "took cold;"

his cough was increased and the expectoration was considerable. He did not, however, lose in weight or in strength. He had had no medication, and had taken alcoholic stimulants very moderately. In February, 1867, he reported improvement, having now very little cough and expectoration. The signs noted at this time were as follows: Dulness on percussion at the summit of the chest on the right side, broncho-vesicular respiration, and increase of vocal resonance. During the following summer he spent several weeks at the "Adirondacks," camping out and much exposed to the weather. On one occasion he walked four miles in water up to his knees and sometimes as high as the waist, with no ill effect. In November of that year he had very little cough and expectoration; his appetite and digestion were good, and he had gained during the autumn nine pounds in weight. He had lately taken cod-liver oil and alcoholic stimulants moderately, with generous diet and much out-of-door life. In October, 1868, I noted that he had passed the winter and spring in New York, officiating as rector of a large parish, and the summer had been passed in the country. He had lately substituted for the cod-liver oil, cream and whiskey. In October, 1869, I noted that since the last record he had had good health. He was now almost entirely free from cough. The only physical signs of disease now found were feebleness of the respiratory murmur and increase of vocal resonance at the right summit. In April, 1870, I noted that I had recently met him, and that he appeared well. He is still living and presumed to be well; but I have noted nothing further, and I have dated his condition at the time of the last record, making five years, whereas, reckoned from the present year (1874), the period would have been nine years.

Case 19. *Good health two years after the development of phthisis.*—Mr. C., aged 22, clerk, consulted me in December, 1868. Cough with small expectoration had existed for two months. His aspect was not marked, and he had lost but little in weight. The appetite and digestion were good. There was dulness on percussion at the summit of the chest on the right side, with an interrupted broncho-vesicular respiration, bronchophonic voice and whisper. Advised him to go to Florida, where he had been before, and, as he was fond of hunting, to devote himself to it during the winter. In August, 1870, his father gave me the following facts: His son returned from Florida apparently quite well. He spent the following summer at Lake George, and remained in good health. In the autumn he went to Minnesota; but as the weather became cold he was not as well, and felt that he should die if he remained there. He, therefore, in January, went again to Florida, and he returned in the spring quite well. He had continued well except that at times he has a slight cough. I examined subsequently a sister of the patient and found a small tuberculous affection; and he had lost a sister with the disease.

Case 20. *Good health four years after the development of phthisis.*—Mr. B., aged 51, consulted me in November, 1869. His mother died with phthisis. Cough had existed for eight months. He had had two or three attacks of hæmoptysis shortly after the commencement of cough. He had taken no medicines, but had been much in the open air. His aspect was healthy. The appetite and digestion were excellent. There was dulness on percussion at the summit of the chest on the right side, with increase of vocal resonance and subcrepitant rales. He again consulted me in April, 1873. He had resided in Aitken for the preceding four winters. He had had profuse bronchial hemorrhage seven times, the last in March, 1872. The loss of blood did not seem to affect him in any way unfavorably. He now weighed more than at the time of my previous examination, his present weight being 210 pounds. He had still some cough and expectoration. His aspect was healthy. His appetite and digestion were good. The following signs were noted: At the right summit the inspiration was notably high, and the expiration was low in pitch. On percussion, with the ear close to the patient's mouth, cracked-metal resonance was discoverable. There were some moist rales. Everywhere, except at the right summit, the respiratory murmur was well evolved and purely vesicular; it was, however, relatively feeble at left summit. He had taken no remedies, and very little of alcoholic stimulants. The axillary temperature was 95½°.

Case 21. *Fair health seven years after the development of phthisis.*—Mr. D., aged about 30, consulted me in January, 1851. Slight cough and expectoration had existed for three years. He was not much under his average weight of health. There was dulness on percussion at the summit of the chest on the right side, with broncophony in that situation, and crackling with inspiration in the infra-clavicular region on both sides. In November, 1855, I noted that this patient was in tolerable health.

Case 22.[1] *Good health five years after the development of phthisis.*—Mr. B., aged about 30, consulted me first in June, 1869. There were at that time signs denoting a small tuberculous affection of the right lung. This fact was noted, and also that the affection was not progressive. The previous duration of the cough was not noted. In December, 1869, I noted that there was relative weakness of the respiratory murmur at the right summit. Soon after this date he went to Europe, and returned in September, 1870. There were now no signs denoting a cavity at the right summit, this fact only being noted, that is, the signs not stated. The cough was now slight. In December, 1870, he had gained in weight, and at this time only feebleness of the respiratory murmur at the right summit was discoverable. The same was noted in January, and in March, 1871. The appetite, digestion, and nutrition were good. This patient has remained in good health up to this time (1874), excepting that he has not been absolutely free from cough. When the disease became developed he was engaged in business in the city. After returning from Europe he took up his residence in the country, where he still resides. He was treated with various tonic remedies.

Case 23. *Fair health two and a half years after the development of phthisis; Cavity.*—Mrs. O., aged 38, was examined by me in March, 1872. Cough had existed for two and a half years. Several months prior to the date of the examination she had slight hæmoptysis. During the first year she took whiskey freely, but has not done so since. She has not at any time been under medical treatment. At the time of the examination her weight was about that of health; the appetite and digestion were good, and her aspect was not morbid. There was dulness on percussion and cracked metal resonance at the summit of the chest on the left side in front, with broncho-cavernous respiration and moist rales. Over the scapula on this side there was bronchial respiration and bronchophony. The menses were regular. No remedies were advised. She resided in the country (Orange, N. J.).

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[1] This case and the cases which follow are not included in the collection, most of them having come under observation after I had begun these clinical studies in 1871.

Case 24. *Good health two and a half years after the development of phthisis.*—Miss A., aged 18, was examined by me in May, 1872. Cough had existed since the preceding January. She had not had hæmoptysis, and she was not now under her average weight in health. There was slight dulness on percussion at the summit of the chest on the left side, with a relatively feeble and broncho-vesicular respiration. The bronchial whisper was increased. Axillary temperature 99½°. The pyrophosphate of iron and quinia were prescribed, with out-of-door life. In November, 1873, she reported well excepting slight cough and expectoration. She had gained in weight, and she had the aspect of robust health. There was some granular pharyngitis. The same signs existed, but in a less marked degree. At the present time, as I am informed, she considers herself well. I embrace the case in this group rather than in the list of cases ending in recovery, because I am not certain that she is entirely free from pulmonary symptoms.

Case 25. *Fair health four years after the development of phthisis.*—Mr. P., aged 32, consulted me in July, 1872. Cough had existed for a year. The preceding winter he had passed at Mentone, under the professional care of Dr. Henry Bennet. The following signs were noted: Notable dulness on percussion at the summit of the chest on the left side, with diminished motion, feeble respiratory murmur and increase of vocal resonance. His aspect was healthy. He was about ten pounds under his average weight of health. The appetite and digestion were good. Perineal fistula had existed since December, 1871. Axillary temperature 100°. He had taken cod-liver oil during the winter, and alcoholic stimulants. Dr. Bennet stated in a letter that he had improved greatly during his sojourn in Mentone, both locally and generally. In September, 1872, he reported that he was as well as in the preceding July, and the physical signs remained the same. In October, 1873, I noted that he was married a year before, and passed the last winter in Mentone. His aspect was healthy, and he had no cough. The appetite and digestion were good. Had taken cod-liver oil most of the time. The following were the signs noted: depression and deficient motion at the left summit; dulness on percussion in this situation ; in front, feeble respiration, the expiratory sound prolonged and low, and the vocal resonance greater than on the right side. Over the left scapula the respiration is broncho-vesicular, and the voice slightly bronchophonic.

I have recently (August, 1874) been informed by a relative of the patient that he remains as well as when the preceding examination was made.

Case 26. *Good health nine years after the development of phthisis.*—Mr. W., aged 34, with phthisical antecedents, consulted me in July, 1872. He had been examined eight years previously by Dr. Bowditch, of Boston, who found the signs of tuberculous disease at the summit of the chest on the left side. Since that time he had spent each winter, with the exception of the last, in a warm climate. He had travelled around the globe. His general health was now good, and he had no habitual cough. At the left summit there was depression, with deficient motion and feebleness of the respiratory murmur. The axillary temperature was 99½°. He had granular pharyngitis. I examined him again in June, 1873, and found the same signs. His general condition was as good as in July, 1872 ; but he had a slight cough. Meanwhile, he had been in Europe, the West Indies, and California.

Case 27. *Health good over four years after the development of phthisis.*—Mr. F., aged 28, consulted me in October, 1872. Cough had existed for over two years, the precise duration not having been noted. He had had repeatedly attacks of profuse hæmoptysis, the last having occurred during the preceding summer. His family are consumptive; he has lost a sister with phthisis, and his mother has the disease. He had been in Europe, in Nassau and Aitken, and he had made a voyage around Cape Horn. The cough was slight ; there was slight dulness on percussion at the right summit of the chest, with feebleness of the respiratory murmur, increase of vocal resonance, and undue transmission of the heart-sounds. In June, 1873, he again consulted me. The preceding winter hè had passed in southern California. On his voyage thither he was wrecked, suffering much from exposure and lack of food. He had an attack of profuse hæmoptysis while on his journey. During his residence in California he lost his cough, and it had not returned. On examination of the chest the same signs as on the previous examination were found. He consulted me again in July, 1874. He had passed the preceding winter in California. The weather there had been exceptionally cold and wet. In February he "took cold," as he thought, and his cough had continued. There had been no recurrence of hæmoptysis. His weight was not below his average of health. The dulness on percussion, with feebleness of respiration and increased vocal resonance at the right summit continued as before, and there were some moist rales at the left summit.

Remarks.—The history and signs in this case seemed to show, at the time of the last examination, a slight new development of the disease at the left summit.[1]

This patient took no medicines, excepting during attacks of hemorrhage.

Case 28. *Good health two years after the development of phthisis; Innocuous Cavities.*—Mr. T. was examined by me in June, 1873. The preceding winter he had passed in Mentone, under the care of Dr. Bennet. Dr. Bennet stated in a letter that when the case first came under his observation in December, 1871, there was well-marked tuberculous disease at the apices of both lungs, the left lung being the one most affected. He was emaciated, and had paroxysms of fever followed by sweating. The improvement during the winter at Mentone was marked. During the following summer he travelled about Europe, and the following winter was passed at Mentone. He had just returned to New York. His aspect was now healthy; his appetite and digestion were good, and he was up to his average weight of health. He had never had hæmoptysis. The following were the signs noted: At the summit of the chest on the left side, depression and deficient motion. Dulness and the quality of resonance tympanitic in that situation. The respiration here extremely weak and low in pitch, vocal resonance increased, but the voice not bronchophonic. The whispered voice low in pitch. A few subcrepitant rales at the right summit. He had taken the cod-liver oil. In July, 1873, my examination was repeated, and the same signs found. He had now no cough nor expectoration. He had considerable pharyngitis. In December, 1873, I noted that he remained quite well, having still no cough nor expectoration. He is about up to his normal weight; his appetite and digestion are good, and his aspect denotes perfect health. He was taking no remedies, and wine very moderately. Since his return from Europe he had remained mostly in the city, attending to business within doors, about five hours daily. Repeated the physical examination with the same result as before.

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[1] The subsequent history (September, 1874) denotes progress of the recurring affection.

Remarks.—The signs in this case are considered as denoting cavities, which were dry and innocuous, inasmuch as there was no cough or expectoration. This case might perhaps have been with propriety included among the cases ending in recovery.

Case 29. *Fair health many years after the development of phthisis.*—Mrs. M., aged about 35, was examined by me in December, 1872. Cough and expectoration had existed for many years. There were at this time depression, deficient motion, and cracked metal resonance at the summit of the chest on the left side. In May, 1874, the cough was insignificant, and her general health fair. There was depression with deficient motion at the left summit, but the cracked metal resonance was wanting. The respiration in this situation was very weak. The vocal resonance was increased, and the heart was raised upward. This patient is still in fair health (August, 1874). She has been treated with chalybeate tonics and arsenic.

Case 30. *Fair health with cavities three years after the development of phthisis.*—Mrs. M., aged 38, consulted me in January, 1874, especially for an otitis, which she thought might be connected with disease of the throat. She had slight pharyngitis. On examining the chest, there was notable pulsation in the second intercostal space close to the sternum on the left side. At the left infra-clavicular region on this side, there were cavernous breathing, cracked metal resonance, and intense vocal resonance. There were no signs denoting solidification. Cough had existed for three years. She had had slight hæmoptysis a year after the commencement of cough. The first summer after she began to cough she spent in Minnesota, and she improved during this summer. Since then she had remained in the city in the winter season, going into the country in the summer. She had never had any medical advice, and taken no remedies excepting for the past year she had taken cod-liver oil and lime. Her appetite was fair, and she was not much under her weight of health.

The menses continued, but were scanty. She had considerable expectoration.

Case 31. *Arrest of phthisis and its recurrence.*—Gen. F. consulted me in July, 1870. I noted that there was evidence of tuberculous disease at the summit of the chest on the right side, without noting the signs, or any of the symptoms save the axillary temperature, which was 101°. He consulted me again in July, 1874, and stated that after his former consultation he went into Vermont and returned to the city apparently quite well. He took the hypophosphites, and alcoholic stimulants moderately. He engaged in office duties, as editor and also private secretary to the mayor of the city. He remained well until about eight months prior to the second consultation, when he began again to cough. He had some pharyngitis, and was treated by local applications for this affection without benefit. He was about six pounds under his average weight; his aspect was not morbid, and his appetite and digestion were good. At the right summit there was dulness on percussion, with broncho-cavernous respiration in front, and over the scapula there were bronchial respiration and bronchophony. The hypophosphites were again prescribed, and cod-liver oil, together with relinquishment of his office duties, and out-of-door life in the country. Pursuing this course after a month he had gained nine pounds in weight; his aspect had become healthy, and his cough had nearly disappeared. After two months he had gained fourteen pounds in weight; his aspect was healthy, and he reported himself well excepting some cough, chiefly in the morning. He had taken steadily the cod-liver oil, the hypophosphites, and Jamaica rum moderately.

Of the non-progressing cases, in all several months, and in the majority many years, elapsed without any evidence of progress of the disease. In these cases, therefore, there was an arrest of the disease; in other words, they are exceptions to the rule that phthisis is progressive. The agency or agencies determining the progress of the disease did not, in these exceptional cases, continue in operation, or, to vary the mode of expression, the pathological condition, whatever it be, which underlies the local development of phthisis, either ceased to exist, or it was in abeyance; hence, the propriety and significance of the term arrest. Now, in respect of arrest, these cases are in the same category as the cases ending in recovery. In each of these two groups of cases there was an arrest of the disease; the difference between the two groups being that, whereas in the cases ending in recovery there remained no symptoms of any pulmonary affection, the cases in the other group were not without those symptoms. The recovery in the latter cases was not complete, certain lesions remaining, not in consequence of the persistence of the essential disease, but because there was either a deficiency of restorative power, or the lesions were of such a character that they were necessarily permanent.

Studied with reference to the circumstances which may be supposed to have been more or less instrumental in causing arrest of the disease, the two groups of cases are alike valuable. Adding together the cases in the two groups, the number is 75. For reasons which have been stated (*vide* page 213), these 75, out of about 670 cases, cannot be taken as showing the proportion of cases in which an arrest of phthisis may be expected to take place; still less is it fair to say that these 75 cases and those which are noted as having ended fatally (279) represent the ratio of the cases of arrest to fatal cases. There is another aspect in which the cases in both groups may be regarded in order to form some idea of the chances of arrest. These 75 cases have been recorded (with the exception of a few cases) between 1836 and 1870, that is, during a period of thirty-four years. During the first twenty-five years of this period I made records of all cases of any importance, both in private and in hospital practice. For the past eight or ten years my other duties have been such that it has been impossible to do this, and I have been obliged to content myself with recording in full only some cases, keeping brief memoranda only of the most of those occurring in private practice. Still, during these eight or ten years I should not have omitted to make records of cases of arrested phthisis coming under my observation, and I have included in the groups of cases of recovery and arrest those which have come under my observation from 1870 to the present time (August, 1874). So that 75 cases must be nearly all in which I have known an arrest of phthisis to take place, either with or without complete recovery, during a practice of thirty-eight years.

I proceed now to analyze the thirty-one cases of arrested phthisis, having in view the two points of inquiry, in relation to which the cases ending in recovery were analyzed, namely: 1. The amount of pulmonary disease, and 2, the circumstances, aside from the amount of the disease, which may be regarded as either contributing to or favoring the arrest. It will be interesting and perhaps instructive to bring the two groups into comparison with respect to these points of inquiry.

1. With respect to the amount of pulmonary disease, adopting the divisions into five classes, as in analyzing the cases ending in recovery (*vide* page 214), namely, small, moderate, considerable, large, and advanced, the following is the analysis of 26 cases, the histories in 5 cases being defective in information on this point: Of the 26 cases, in 4 the amount of the pulmonary affection was small; it was moderate in 6 cases; in 11 cases it was considerable, and in 5 cases there were present signs denoting cavities. This result is in striking contrast with that of the analysis of the cases ending in recovery; of the latter (44 cases), the affection being small in 25, moderate in 4, considerable in 10 cases; in only one case being large and in one advanced. This contrast shows that, although an arrest of the disease is not precluded by its amount being considerable or its having advanced to excavation, complete recovery, under these circumstances, is not likely to ensue. Evidently, in the majority of the cases of arrest without recovery, the obstacles preventing the latter were the amount of the disease and the existence of cavities. It is, however, a noteworthy fact that in two of the cases (Nos. 22 and 29) the cavernous signs, which had been distinct, disappeared, the fact showing either cicatrization of the cavities or notable diminution of their size. The innocuousness of excavation as represented by *embonpoint* is strikingly illustrated in case No. 20, the patient presenting cavernous signs, and weighing 210 pounds.

2. With respect to the import of age in this group of cases, the facts are as follows: The minimum age was 18 years, which was represented by a single case. In one case the age was 19 years. In 7 cases the ages were between 20 and 25 years inclusive. In 10 cases the ages were between 25 and 30 years inclusive of the latter. In 7 cases the ages were between 30 and 35 years inclusive of the latter. In one case the age was between

35 and 40 years; in one case, between 45 and 50 years; and in one case the age was 51. Thus, in 19 out of 29 cases, the age was under 30 years, and in 10 cases over 30 years. It will be observed (*vide* page 214) that these facts correspond with those obtained by an analysis of the cases ending in recovery, and support the conclusions stated in that connection.

3. As regards sex, of the 31 cases 21 were males and 10 females. The relative proportion of females is somewhat greater than in the group of cases ending in recovery; but, in view of the facts stated under the heading of sex in connection with the latter group, the conclusion is the same, namely, that the result of the analysis is negative in respect of any influence pertaining to sex.

4. The existence or otherwise of family predisposition was noted in only 9 of the 31 cases. Of these 9 cases, in 7 there was evidence of a family predisposition, and in 2 cases there was no evidence thereof. The analysis of these few cases go to corroborate the conclusion drawn from the cases ending in recovery, namely, that the absence of family predisposition is not of much importance as a ground for a favorable prognosis.

5. The facts respecting hæmoptysis, in this group of cases, are as follows: The histories contain no account of its occurrence or non-occurrence in 13 cases. Of the remaining 18 cases, in 2 it was noted not to have occurred; the fact only of its occurrence was noted in 4 cases; it occurred repeatedly, the profuseness, or otherwise, of the hemorrhage not having been noted, in 3 cases; it is noted to have occurred but once, the hemorrhage not profuse, in one case; in one case it occurred repeatedly, the hemorrhage not being profuse, and in 7 cases it occurred repeatedly and was profuse. Of these 7 cases, in one case it occurred 30, in one case 20, in one case many times, and in one case it is noted as having occurred often. There is a striking coincidence in the proportion of cases in which the hemorrhage was repeated and profuse in this group, as compared with the group of cases ending in recovery; and, in general, the analysis, with reference to prognosis, of the former, corroborates the conclusions dawn from the analysis of the latter group.

6. Chronic laryngitis did not exist in any case of this group. Pleurisy with effusion had existed in one case four years prior to the development of phthisis; in no other case is it noted to have preceded, and in no case is it noted to have occurred as

a complication. In no case in this group did perineal fistula occur.

7. An examination of the histories with reference to appetite, digestion, nutrition, and to symptoms referable to other anatomical systems, warrants the statements made concerning the cases ending in recovery. Exclusive of three cases, the histories of which are wanting in information, the appetite and digestion were noted as good in 16, and as fair in 10 cases. In none of these 26 cases was there great emaciation. In one case diarrhœa existed and was somewhat persistent, but in this case the nutrition was not greatly impaired. In one case it is noted that the patient was at one time emaciated and had night-sweating. The latter symptom was noted in several cases. I have examined the cases in this group with regard to the mental character, and I find that what was stated in this regard concerning the cases ending in recovery, holds true to the same or even to a greater extent; most of the patients evinced in their conduct notable determination of will and perseverance in carrying out measures, especially of hygiene, with a view to resisting and overcoming the disease.

8. The facts respecting the time which had elapsed from the development of phthisis up to the last date in the records, are as follows: The shortest time is six months (one case), and the next shortest is fourteen months (one case). In 11 cases the time was over two and under five years; in 9 cases it was from five to ten years; in 2 cases from ten to fifteen years; in 2 cases from fifteen to twenty years; in 1 case twenty-five years; in 2 cases from twenty-five to thirty years; and in 1 case the time is noted as many years.

9. In three of this group of cases the histories show a second development of phthisis. In one of these cases (No. 8), there was in fact recovery from both the first and the second attack, the latter having been slight. In another (No. 27), the recurring disease at the time of writing (September, 1874), is apparently progressing. In the remaining case, an arrest of the second attack appears to have speedily taken place (No. 31).

10. In one of the female cases it is noted that the menses were scanty and irregular (No. 6). In another case the menses were not suspended (No. 14). And in another the menses were regular, excavation existing in this case.

Cases of Slowly Progressing Phthisis.

The cases embraced in this group are of interest as illustrating the tolerance of phthisis, and the slowness of its progress. Next to recovery or arrest of the disease, it is obvious that the objects to be hoped and striven for are tolerance and slowness of progress. The cases in this group are therefore important with reference to prognosis, as showing the extent to which the disease may be tolerated, and the length of time it may continue before ending fatally. The study of this group of cases, moreover, may have importance with regard to the circumstances either determining or favoring tolerance of the disease and the slowness of its progress.

Pursuing the same course as in the study of the cases of recovery from, and of arrested, phthisis, I shall give abstracts of the cases severally which are embraced in this group.

Case 1. *Death from phthisis fourteen years after the development of the disease.*—Mr. R., aged 25, was examined by me first in 1851. The result was negative. I examined him next in September, 1855, and found the evidence of a small tuberculous affection. Shortly before the second examination he had had hæmoptysis. From this date he was never free from cough and expectoration. An examination in August, 1856, gave evidence of tuberculous disease, still small in amount, with lobular emphysema. In October, 1862, another examination showed some progress of the disease. Meanwhile, hæmoptysis had occurred twice, the hemorrhage being small. He had not been under any medical treatment. He had taken whiskey moderately. He had made two voyages to Europe, and was now actively engaged in business. In September, 1866, I noted that perineal abscess had occurred in the preceding March, and that it had ended in fistula. In that month, also, he had profuse hæmoptysis which recurred for several successive days. There was then dulness on percussion over the right scapula, with broncho-vesicular respiration, bronchophony, and moist rales. The axillary temperature was 100°. The patient slowly but progressively failed, and died in January, 1869. He continued to attend to his business, which was that of an agent and speculator, going to his place of business, distant from two to three miles from his residence, the day before his death. The fistula had healed spontaneously. The only treatment in this case was the moderate use of whiskey, with the citrate of iron and quinia, from time to time, and palliatives for cough.

Case 2. *Death from phthisis fifteen years after the development of the disease.*—Prof. E., aged about 25, in 1851, had a slight bronchial hemorrhage, not preceded nor followed by cough, and an examination of the chest was made at that time with a negative result. He was then just entering upon the practice of medicine. In 1858 he had a second hemorrhage which was slight, and this attack was followed by slight cough and expectoration. In September, 1860, I examined the chest and found dulness on percussion over the right scapula, the respiratory murmur everywhere feeble, and crackling at the end of inspiration at the summit of the chest on both sides. He was at this time somewhat under his average weight of health, but in general he was well and strong. He was now largely engaged in medical practice, and during the winter season he was also occupied in giving anatomical lectures. I did not afterward examine the chest, but I was advised of his condition by medical friends. He considered himself as affected with phthisis, and he combated the disease as well as he could, continuing in practice and in the duties of his professorship, taking alcoholic stimulants pretty freely, until, about 1870, he removed to southern California, with the hope of deriving benefit from this change of climate, his residence having been in western New York. The change seemed to prove beneficial, but he died in the winter of 1873–74, after a fatiguing journey made to a patient at a distance.

Case 3. *Death from phthisis, the duration of the disease probably exceeding forty years.*—Mrs. T., a relative of the author, had been an invalid, having had constantly more or less cough and expectoration from my earliest recollection. She could not fix the date of the commencement of the cough.

In October, 1861, I noted the following signs: Dulness on percussion at the summit of the chest on the right side, with broncho-vesicular respiration, and moist bronchial rales. During the twenty years preceding this date she had crossed the Atlantic and travelled in Europe three times; she had given great care to health, but had never taken medicines nor stimulants. She died in January, 1867, aged seventy-two. During the last six years of her life she was extremely feeble, but going out of doors until a short time before her death. She passed the winter in either New York or Philadelphia, and the summer season in the country, in New England. During the last few years of her life she took some tonic remedies, some cough palliatives, and alcoholic stimulants in very small quantity. Long before her death there were cavernous signs at the summit of the chest on the right side, with notable contraction; and owing to the diminished volume of the upper lobe on this side, the heart was removed to the right of the sternum.

Case 4. *Death from phthisis twelve years after the development of the disease.*—Dr. S., aged 24, came under my observation in July, 1862. His mother had recently died with phthisis, and other members of his family had had the disease. He was addicted to study, and disinclined to physical activity. Eight months prior to the above date he had had pleurisy, and was confined to the bed for some time. He had not had hæmoptysis. There was now no cough; he was up to his average weight, and his appetite and digestion were good. The right side of the chest was moderately contracted, and the respiratory movements were diminished. There was dulness on percussion everywhere on this side, the dulness being greater at the summit than at the base. The murmur of respiration was everywhere on this side feeble; at the summit in front it was accompanied by crumpling rales. At the summit, behind, the expiration was prolonged and high in pitch, and the vocal resonance was increased. He was taking cod-liver oil, with whiskey in small quantity. Out-of-door life and travelling were advised. In September, 1862, he went to Europe. In October, 1870, I noted that he had been a portion of the time since the previous examination in Europe. He had married after his return, and had now two healthy children. His aspect was healthy, but he had lately lost in weight, and he had cough. There was broncho-vesicular respiration, with bronchophony over the right scapula; and, in front, on this side, at the summit, notably feeble respiratory murmur. He had lived freely, in luxurious indolence, drinking from two to three pints of champagne daily. Shortly after this date he again went to Europe, and died abroad in May, 1874.

Case 5. *Death from phthisis fourteen years after the development of the disease.*—Mr. A., aged 24, had hæmoptysis in 1852. I examined the chest at this time, but made no record of the signs. He was never afterward free from cough. He next came under my observation in October, 1862. Meanwhile he had had recurrence of the hæmoptysis once or twice in each year. He had attended to his business, that of a publisher, during the whole period. For the last four years he had taken half a wineglass of whiskey before breakfast, and none at any other part of the day. This had constituted the treatment, excepting when he had hæmoptysis. The cough and expectoration were slight. He was not emaciated nor feeble, and his aspect was healthy. There was now marked dulness on percussion at the summit of the chest on the right side, with deficient respiratory movement in this situation, feeble respiratory murmur, subcrepitant rales, and increased vocal resonance. The treatment consisted of chalybeates, whiskey, and cream; and he was advised to get as much out-of-door life as was practicable. In March, 1863, he had improved. He sailed for Europe in this month. In October, 1863, I noted that he had recently returned from Europe, and was in all respects improved. In addition to the signs previously noted, there was now feeble respiratory murmur over the whole of the right side of the chest, showing obstruction of the right primary bronchus. His cough was slight. He had taken very little medicine, and he had used alcoholic stimulants moderately. I thought that the signs denoted some diminution of the solidification of the apex of the right lung. In January, 1866, I noted that about a fortnight prior to this date, being apparently quite well, excepting some cough, and about to sail for Savannah, he was seized with hæmoptysis, which had continued to recur at short intervals. At times the hemorrhage was profuse. He had become notably pallid. Death took place a few weeks afterward.

Case 6. *Death from phthisis eight years after the development of the disease.*—Mr. C., bookkeeper, aged about 21, consulted me first in December, 1863. Both parents are now living and well. He had had a slight, dry cough for some time, and recently a bronchial hemorrhage, moderate in amount, had occurred. His aspect was not notably morbid. His appetite and digestion were good. There was great dulness on percussion at the summit of the chest on the right side; the respiration in this situation was nearly bronchial, and bronchophony was marked. He had been taking the cod-liver oil. I advised its continuance, with alcoholic stimulants moderately, relinquishment of his occupation, a generous diet, and as much out-of-door life as practicable. In February, 1864, I noted that he was much improved; his aspect was now healthy, and, excepting some cough and expectoration, he seemed to be quite well. The same signs, however, at the summit of the chest, on the right side, continued. He had carried out the dietetic and regimenal course which had been advised, but of late he had discontinued the cod-liver oil. In May, 1864, the improvement had been progressive. He reported that he was free from cough and expectoration. The dulness on percussion at the summit of the chest, on the right side, had diminished; the inspiratory sound was feeble and low in this situation, and the expiratory sound prolonged and high; bronchophony had given place to simple increase of vocal resonance, and there was increased bronchial whisper. He had recently had a slight hæmoptysis. He had taken no medicine, but had drank porter moderately, living generously, and being most of the time out of doors. In October, 1865, I noted that he had considered himself well until within a few weeks. He had returned to his situation as a bookkeeper. He now consulted me on account of a recurrence of hæmoptysis, which was profuse. In December, 1867, he again consulted me. After his attack of bronchial hemorrhage in 1865 he returned to his duties as a bookkeeper, and had continued to perform them up to the present time. He had considered himself well up to a recent period, when his cough returned, and he had another hemorrhage, which was slight. There were now no signs of solidification discernible at the summit of the chest on the right side, or elsewhere. There were some moist rales at the summit on the right side. He now decided to quit again his occupation. In January, 1868, he went to Europe, returning in the May following. On his return he appeared and reported himself to be well. In May, 1869, I noted that he had remained apparently well during the past winter and spring, taking an abundance of exercise out of doors. He had, however, had repeated attacks of hæmoptysis. There was some depression at the summit of the chest on the right side, but no signs of solidification; and the respiratory murmur was everywhere vesicular. In August, 1869, I noted that he had recently had hæmoptysis, but that he reported having had for six months no cough, and having in this time gained ten pounds in weight. His aspect was healthy. He had taken no remedies. On an examination of the chest everything seemed to be normal. In April, 1870, I noted that he had had cough, with considerable expectoration, for the preceding six months. There was now dulness on percussion at the summit of the chest on the *left* side, with increase of vocal resonance and subcrepitant rales; also, an abnormal transmission of the heart-sounds. During the winter he had exercised daily in a gymnasium, and had held his own as regards weight and strength. The appetite was good. He had taken no remedies nor alcoholic stimulants during the winter. I now advised the use of the cod-liver oil and the hypophosphites. I did not see this patient afterward. His death occurred within a year from the date of the last record.

Remarks.—This case is remarkable in several points of view, namely, 1st, the complete disappearance of cough and expectoration, together with apparently excellent general health; so that, were it not for repeated attacks of hæmoptysis, the patient could be considered as having recovered; 2d, the complete disappearance of the signs of solidification at the summit of the chest on the right side within a year, the solidification having been considerable both in degree and extent, and the return of vesicular respiration; 3d, the subsequent development of tuberculous solidification at the upper part of the left lung; 4th, the frequent recurrence of hæmoptysis.

Case 7. *Phthisis progressing but little, if at all, during two and a half years.*—Mr. R., aged 26, fur trader, consulted me in October, 1866. He was accustomed to much out-of-door life in Kansas. There was no family predisposition to phthisis. Cough and expectoration had existed for four months. His aspect was healthy, and he was not under his average weight in health. There was slight dulness on percussion at the summit of the chest on the left side, with a broncho-vesicular respiration. The iodide of potassium was prescribed. In November, 1866, the same signs were noted. He reported the cough and expectoration to be about the same The muriate of ammonia was substituted for the iodide of potassium. In July, 1867, the signs were not as distinct as previously. He had dyspeptic symptoms, for which dilute sulphuric acid was prescribed. In February, 1868, there was still dulness at the summit of the chest on the left side, the respiration in this situation being broncho-vesicular, and more intense than on the right side. There was increased vocal resonance and bronchial whisper, with an abnormal transmission of the heart-sounds. He had just returned from "the Plains," and complained chiefly of indigestion, with looseness of the bowels. The cough was slight. In July, 1868, he was recently from Pennsylvania, where he had had an acute affection of the chest, which was called lung fever. He had remained feeble since that affection, having up to that time preserved his strength, and being apparently well excepting a slight cough and dyspeptic ailments. He was now ten pounds under his weight of health. There was dulness on percussion at the summit of the chest on the left side, with feeble respiratory murmur and subcrepitant rales. There was also deficient superior-costal movements in respiration. In February, 1869, there was vesiculo-tympanitic resonance at the summit of the chest on the left side, with feeble respiratory murmur. The vocal resonance and bronchial whisper were increased in this situation. There were no rales. The cough and expectoration were moderate. His aspect was healthy. His digestive powers were weak, and he was subject to diarrhœa. He had passed the winter thus far in Minnesota. He proposed to go to the South for the spring months, and afterward to the Rocky Mountains. I have no further record of this case.

Case 8. *Phthisis progressing very slowly during five years.*—Mr. C., aged about 38, came under my observation first in November, 1867. He then had pleurisy, and the left pleural sac was filled with liquid. After a few weeks the liquid was absorbed, and no positive signs of phthisis were then discoverable. He spent the spring months in Cuba, and returned apparently quite well. During the following summer he had slight cough, but he held his own as regards weight and strength, in these respects being but little under the maximum of health. In the autumn his cough increased; he had small expectoration, and he lost somewhat in weight and strength. His appetite became impaired. Shortly before my examination he had had hæmoptysis, the amount of hemorrhage being small. There was slight dulness everywhere over the left side. The respiratory murmur at the summit on this side was weak. No other signs were noted. The physical diagnosis of tubercle was not considered to be positive. He went to Cuba shortly afterward, and remained until nearly June in 1869. He had not been free from cough, but his general health was good. There was now increased vocal resonance at the left summit and some moist rales. He now proposed going to California by rail; returning by water and going to Europe in the autumn. I saw him again in February, 1872. His condition at this time was not as good as in 1869, the details, however, were not noted. He is still living September, 1874, but he has not been under my observation since February, 1872.

Case 9. *Solidification of the lower lobe of the left lung of ten years' duration.*—Phœbe S., aged 5 years, came under my observation in 1865. At that time there was marked dulness on percussion, bronchial respiration, bronchophony and moist rales over the lower posterior aspect of the chest on the left side. At intervals I examined her repeatedly, always finding the signs just named. She was treated with tonic remedies, as much out-of-door life as practicable being enjoined. After having been under my observation for several months, I did not see her again until in November, 1869. Her aspect was then healthy, and she was well developed for her years. She had meanwhile never been without cough. Her appetite was excellent. On examination of the chest, dulness on percussion, bronchial respiration, bronchophony, and moist rales were still found over the lower inferior portion of the chest on the left side. At this time she was brought to me for chorea, for which Fowler's solution was prescribed. In October, 1871, I noted that she had cough with considerable expectoration. Her general aspect, however, was good. The signs still showed solidification over the lower lobe of the left lung. The lower part of the left side of the chest was contracted. Over the upper lobe the respiration was normal. In November, 1874, I made another examination in this case. There was notable dulness on percussion over the lower lobe of the left lung, with absence of respiratory murmur, and the vocal resonance somewhat louder than on the right side, but not bronchophonic. She had still some cough, but without expectoration. She is now sixteen years of age, somewhat under the average size but well developed, and she has a healthful aspect. She has menstruated irregularly during the past three months.

Remark.—There is room for the supposition that the affection in this case is chronic interstitial pneumonia or fibroid phthisis.

Case 10. *Phthisis, pleurisy with effusion, and chronic laryngitis; slow progress of the disease during four years and four months.*— Dr. T., aged 29, practitioner in Tennessee, consulted me in New Orleans in November, 1860. In the June preceding he had had hæmoptysis, which occurred when he supposed himself to be in perfect health. The hemorrhage recurred for several days, and it was profuse. From that time cough and expectoration had continued. In September, 1860, he had pleurisy affecting the left side, accompanied by large effusion. The liquid, however, was rapidly absorbed, and he afterward gained in strength and weight. He was now travelling for health. He had walked two miles to my residence, but was pallid and feeble. A second attack of hæmoptysis had occurred after his recovery from the pleurisy, recurring, as before, for several successive days, the hemorrhage being profuse. The expectoration was now small. The appetite and digestion were good. The pulse was 120. He had taken cod-liver oil and alcoholic stimulants. There was contraction of the right side of the chest, with dulness on percussion over this side and feeble respiratory murmur. Travelling, generous living, and the use of alcoholic stimulants were advised. In February, 1861, he again consulted me. He had gained in weight twenty pounds, and he had considered himself well enough to return to practice, when on the 12th of this month he had hæmoptysis. The hemorrhage was not profuse, and in the following March he resumed his practice, feeling well and strong, his weight never having been greater. He came to New York to consult me in October, 1864. For two years he had had chronic laryngitis, his voice being quite husky. He was thin, but not feeble. He had considerable cough and expectoration. The appetite and digestion were excellent. He had relinquished practice and was engaged in raising tobacco in Tennessee. There was contraction of the right side of the chest, with dulness on percussion everywhere on this side, but greater at the summit than below. The respiratory murmur was feeble on this side, and accompanied with moist rales. I have no further record of this case.

An analysis of these 10 cases with reference to, 1st, the amount of pulmonary disease, and 2d, circumstances contributing to or favoring the slowness of its progress, has somewhat of the importance belonging to the analytical study of the two preceding groups of cases. Considered with regard to the rationale, the three groups, namely, the cases of recovery, of arrest, and of slowness of progress, belong in the same category; whatever conduces, in a certain proportion of cases to either recovery or arrest, it may reasonably be supposed tends in other cases to retard the progress of the disease. I shall, therefore, analyze these 10 cases as I have done the cases in the other groups, following the same order as regards the several points of inquiry.

1. The amount of disease was considerable in 7 cases. It was moderate in 1 case. It was large and advanced in 1 case, and in 1 case the history does not contain data for determining the amount. In no case was the amount small.

2. In 8 of the 10 cases the ages were between 20 and 30 when the patients first came under my observation. In 1 case the age was 38, and in 1 case it was 5 years, the latter being the only case of that age in the whole collection of cases.

3. In 8 of the 10 cases the patients were males and in 2 females.

4. In the histories of 5 cases there is no information respecting family predisposition. There was no evidence of family predisposition in 4 cases, and this predisposition existed in 1 case.

5. In 5 of the 10 cases hæmoptysis occurred repeatedly and profusely, and in 1 case it occurred repeatedly. In 4 cases there was no hæmoptysis.

6. Laryngitis existed in 1 of the 10 cases.

7. Perineal fistula occurred in 1 case.

8. The disease was preceded by pleurisy with effusion in 1 case (No. 8), and the latter affection occurred intercurrently in 1 case (No. 10).

9. The appetite, digestion, nutrition, etc., were either fair or good in 2 cases, good in 5 cases, excellent in 1 case, and in 1 case the patient was a dyspeptic, but the nutrition was good. Not including the case of the child five years of age, in all the cases the patients appreciated the character of the disease, and resorted resolutely to measures for staying its progress. The mental qualifications for a contest with the disease, which have

been referred to in the analysis of the cases of recovery and of arrest, were strikingly manifest in this group of cases.

10. In 6 of the 10 cases the disease is known to have ended fatally; in 3 cases it is not known whether the patients are now living or not, and in 1 case, that of the child, the patient is living. In the 6 fatal cases, the periods of duration were as follows: Forty, fifteen, fourteen, thirteen, twelve, and eight years. In the remaining 4 cases, the periods were as follows: Seven, five, four and a third, and two and a half years.

The conclusions drawn from the analyses, respectively, of the cases of recovery, of arrest, and of slow progress (85 cases), respecting the elements of prognosis, may be embodied in the following propositions:—

1. The probability of recovery from phthisis is much greater, other things being equal, in proportion to the small amount of the pulmonary disease, although recoveries take place in which the amount is large and the disease advanced to the stage of excavation. An arrest of the disease, without complete recovery, is not infrequent when the amount is considerable or large, and when it is advanced to excavation. Slowness of progress may be hoped for, under favorable circumstances, although the amount of disease be large and it has advanced to excavation. The results of my analyses enforce the importance of endeavoring to promote arrest and recovery at as early a date as possible after the development of phthisis.

2. Age and sex have no special importance in prognosis.

3. A family predisposition to phthisis does not weigh heavily against the probability of either recovery, arrest, or slowness of progress.

4. Hæmoptysis, even when repeated and profuse, is not an unfavorable element in prognosis; as a rule it is rather favorable than otherwise.

5. Chronic laryngitis is not an unfavorable event as regards recovery from the pulmonary affection, or the slowness of its progress.

6. The foregoing statement will apply to pleurisy with effusion either preceding the manifestations of phthisis, or occurring as an intercurrent affection.

7. The same statement will also apply to perineal fistula.

8. It is an essential element of a favorable prognosis that

appetite, digestion, and nutrition be not greatly impaired. The probability of either recovery, arrest, or slowness of progress is great, other things being equal, in proportion as these functions, together with symptoms relating to the circulation, temperature, etc., denote tolerance of the pulmonary disease. A determination to overcome the disease, and perseverance in efforts for this end, constitute important elements in a favorable prognosis.

9. Phthisis recurring after recovery or arrest, is likely to prove fatal. There are, however, exceptions to this rule, and recovery may take place after a second recurrence.

10. Inasmuch as the menses, having been suppressed during the existence of phthisis, return after recovery or arrest, their suppression does not necessarily involve an unfavorable prognosis.

Duration of the Disease and the Complications, Events, or Circumstances affecting Duration and Causing Death in the Fatal Cases of Phthisis.

Of 279 fatal cases, the histories contain data for determining the duration in one hundred and twelve. These 112 cases were not all under my observation from the beginning to the end of the disease. Nearly all the histories contain the date of death; but the date of the development of the disease in a large majority of the cases was determined retrospectively, and, of course, some symptom, or symptoms, must be fixed upon as sufficiently reliable for this purpose. My criterion, as already stated, is the commencement of a cough, which had persisted, that is, having never disappeared. I do not claim in behalf of this symptom, that it always denotes the precise time when phthisis begins. That, as a rule, or often, a persistent cough precedes the development of phthisis, I do not believe. It seems to me fair to conclude that the disease existed when such a cough began; but it is not so clear that a cough always attends the beginning of phthisis. Of all the symptoms, there is no one which, singly, is more reliable than this. But, in most cases, there are concurrent symptoms which enhance the reliability of this symptom as a criterion, such as hæmoptysis, loss of weight, pallor of countenance, etc. Taking the commencement of a persistent cough as the event denoting the beginning of phthisis, a difficulty often arises from the inability of patients to note precisely when the cough commences, and also a liability to err in the statements made with reference to this point. The cough is not infrequently for some time so slight as to attract little or no attention; and hence, patients are unable to record the date of its commencement, and they may be at fault in undertaking to do this. Without close questioning, patients are apt to fix the date of the beginning of their illness at a later period than the commencement of cough, that is, they are likely to date from the time when the cough became troublesome or other notable symptoms occurred, thinking the previous cough was of little or no moment. It is proper to state that, appreciating this source of error, in recording histories I have always been careful to obtain information as precise as possible of the beginning of cough, no matter how slight it may have been at first, or if the health in all other respects was apparently good.

The duration, determined in accordance with what has just been stated, in the 112 cases, varied from three weeks to forty years. This is very nearly in conformity with the statement of Portal, that phthisis may last "from eleven days to forty years."

In this analysis of my cases with respect to duration, I do not take into account the cases of acute miliary tuberculosis; the latter are excluded, but other varieties are included. The average duration is a fraction over thirty-three months.[1] This result has an intermediate place when brought into comparison with the mean duration according to the researches of several distinguished observers. Læennec found the duration 24 months; Louis and Boyle (314 cases) 23 months; Andral (cases at la Charité) 24 months; Sir James Clark (cases in private practice) 36 months, and Williams, of London, 48 months.[2]

I purpose now studying the fatal cases with reference to complications and the events or circumstances affecting the duration and determining death. One object of the study is to endeavor to ascertain what complications, events, or circumstances tend either to prolong or shorten the duration of phthisis. For this object I shall select from the cases in which the duration is determinable, two groups as follows: The first group will embrace,

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[1] On reviewing the history and appearances after death in one of the cases. the duration being stated to have been nine years, I am satisfied that the tuberculous disease was not of that duration, but was developed not long before death. The withdrawal of this case will leave the mean duration about 33 months.

[2] Elements of Prognosis in Consumption, by Pollock. London, 1865.

1st, the single case of 40 years' duration; 2d, the single case of about 20 years' duration; 3d, a case of 31 years' duration; 4th, the cases of a duration between 10 and 15 years (7 cases); 5th, the cases in which the duration was between 5 and 10 years (5 cases), and 6th, the cases in which the duration was between 3 and 5 years (9 cases). The whole number in this group is 24 cases. The second group will embrace, 1st, cases the duration of which was between 6 months and one year (19 cases), and, 2d, cases the duration of which was six months or under (23 cases), the whole number in this group being thus 42 cases.

I have selected these cases (in all numbering 66) as representing a duration, on the one hand, considerably above the average, namely, from three to forty years; and on the other hand below the average, namely, one year and under, eliminating the cases in which the duration was not far removed from the average, namely, between one year and three years. In the first group one case is introduced which was inadvertently omitted from the cases analyzed with reference to duration, death taking place in this case 31 years after the development of phthisis.

An analysis and comparison of these two groups of cases in respect of certain points of inquiry, may afford some information concerning the events or circumstances which tend either to prolong or to shorten the duration of phthisis.

1. In the case of supposed forty years' duration, or longer, the age of the patient, at the date of death, was 72. The amount of pulmonary damage was very great. Cavernous signs were present long before death; and the shrinkage of the right lung was such that the heart was removed to the right of the sternum. There was no important complication. The greatest possible pains were taken, in this case, to prolong life by changes of climate, etc.; and the circumstances surrounding the patient, as regards abundance of pecuniary means, freedom from household cares, the assiduity of friends, etc., were all that could be desired. The patient possessed great equanimity of disposition united with resolution of character. Death took place by slow asthenia. This case is included among the cases of "slowly progressive phthisis." (Case No. 3, *vide* p. 244.)

2. The case in which it is noted that cough had existed continuously for nearly twenty years, was observed in Charity Hospital, New Orleans, in March, 1861. The account of the previ-

ous history is very meagre. The patient was of the male sex, and 40 years of age. He died from three to four weeks after his admission into hospital. It is noted that he had had hæmoptysis repeatedly. While in hospital the most prominent symptom was dyspnœa. On account of this symptom he was compelled most of the time, night and day, to keep the sitting posture. On post-mortem examination, the upper lobe of the right lung was converted into a series of cavities having the characteristics of phthisis, and evidently of long standing. There was no recent exudation, excepting a few nodules at the base of the left lung. One of the cavities contained a cheesy mass of the size of a small bean. A portion of the right lung, of about the size of an orange, was in a condition of red hepatization. The upper lobe of the left lung presented the characters of atrophic emphysema, air sacs from the size of a pea to that of a walnut existing, evidently produced by destruction of the cell walls. The volume of this lobe was considerably diminished. A few nodules were found in the lower lobe of this lung. The heart was enlarged, weighing fourteen pounds, the enlargement being on the right side, which was hypertrophied and dilated, dilatation predominating. A more detailed account of the post-mortem appearance is given in Chap. I. (*Vide* page 37.)

In the absence of details of the previous history of this case, it may be inferred, from his being a patient in a pauper hospital, that the circumstances of his life were quite the opposite to those in the preceding case. The death was attributable in a great measure, if not chiefly, to the complications, namely, atrophic emphysema, dilation of the heart, and circumscribed acute pneumonia. There is reason to suppose that the phthisis, or rather its sequels, that is, the tuberculous cavities, were well tolerated, and that, but for the complications just named, life might have been prolonged indefinitely.

3. A case in which the disease existed for thirty-one years, may be here introduced. This case is included in the list of cases of arrested phthisis (No. 15, *vide* page 229). The age at the date of the development of the disease was 25 years. He had numerous attacks of hæmoptysis during the first few years. When he came under my observation the disease had existed twenty-four years. He was then thin and rather feeble, and was deficient in breath on exercise. He died seven years afterward,

the immediate cause of death being some intestinal affection. He was engaged in business, but under circumstances which enabled him to take great care of his health. He had passed some time in Europe, and spent several winters in the West Indies. He was extremely careful in everything relating to health. He took alcoholics sparingly if at all.

4. Passing to the series of cases, the duration of which was between ten and fifteen years, I shall give the results of an analysis without an account of each case separately.

These seven cases were all of the male sex. The ages, at the commencement of the disease, in six of these cases (in one not noted) were, 25, 24, 24, about 25, 29, and 31 years. Five of the cases were in private, and two were in hospital, practice. The two hospital patients were laboring men. One of these had continued to labor as usual up to three years before his death (eight years), and had done light work as a gardener up to nine weeks before death. Five weeks before death he took to the bed. He had œdema of the lower limbs, and some anasarca shortly before death. There is no note of an examination of the urine. There was no autopsy. In the other hospital case, the chronic followed some acute affection of the chest. He had worked as a laborer up to a year, and had continued to do light work up to three weeks before his death. During these three weeks he had kept the bed. A post-mortem examination showed circumscribed empyema at the lower part of the right side, the pleural cavity containing a quart of fetid pus. Perforation was inferred, but not demonstrated. The right lung was solidified by tuberculous exudation, a portion of which was softened, and there were several small cavities. The habits of these patients, as regards intemperance, etc., were not noted.

Of the five patients in private practice, one was a fuller in a woollen mill; he continued to perform his usual labor up to a year and a half, and he did light work up to a few weeks, before death. He was intemperate. The post-mortem examination showed numerous large and old cavities in both lungs, with an abundance of miliary granulations, and enlargement of the bronchial glands. The mode of dying was by asthenia; and the death seemed to be due solely to the pulmonary disease.

Two patients in this series were members of the medical profession. One continued in practice up to the time of his death, and for many years was a professor of anatomy in a medical school. Two or three years before his death he removed from Western New York to Southern California, where his health improved. He died from some acute attack, the character of which is unknown. He used alcoholic stimulants quite freely. (*Vide* case No. 2 of "slowly progressive phthisis," page 244.) There was no post-mortem examination in this, nor in any of the remaining cases of this series. The other member of the medical profession, never engaged in practice. He was healthy, lived freely, travelled in Europe, and died abroad. He had fair general health up to a couple of years before his death, having married and had two healthy children. (*Vide* case No. 4 of "slowly progressive phthisis," page 245.)

The two remaining patients in this series were business men, one a book publisher, the other an agent and speculator. The latter continued actively engaged in business up to a few days before death. (*Vide* No. 1 of "slowly progressive phthisis," page 243.) He had repeated attacks of profuse hæmoptysis. A perineal fistula occurred three years before his death, and persisted. There was no other complication. He used alcoholics moderately. The other patient also had repeated attacks of profuse hæmoptysis, and death followed upon a hemorrhage abundant and repeated for several days. (*Vide* case No. 5 of "slowly progressive phthisis," page 246.) Up to the occurrence of this hemorrhage he had had fair health, being actively occupied in his business. The pulmonary affection was uncomplicated. He spent several months in Europe some years before his death. He used alcoholics very moderately.

Are there any circumstances or events which, from their being common to these seven cases, tended, as we may suppose, to prolong the disease to from ten to fifteen years? No importance, in this point of view, is to be attached to age, for in six of the cases the disease commenced between the ages of twenty and thirty-one, the age not having been noted in the other cases, and in the greater majority of the cases of phthisis, the ages are within this period in life. There would seem to be no evidence of occupation or situation in life having had any influence to prolong the disease. Two of the patients ended their days in a pauper hospital, and were common laborers; another was a workman in a woollen mill; two were business men, the duties of both keeping them much within doors; one was a practising physician, and one a gentleman of leisure and of luxurious habits. As regards the use of alcoholics, one patient was intemperate; two patients took stimulants daily and freely, and two used them moderately. The habits of the two hospital patients in this respect were not noted, but it is pretty safe to conclude that these were not temperance men. As regards causes of death, other than the phthisis, in two of the cases there was apparently no complication or intercurrent affection; in one case there was circumscribed empyema, probably from perforation; in one case some affection, the nature of which is unknown, was the immediate cause of death; in one case some unknown condition, either immediately preceding or following profuse hæmoptysis, occurred, and in two cases there is nothing noted with respect to this point. In view of the foregoing facts, all that can be said is, the disease, in these cases, was, for a long period, either non-progressive, or it progressed very slowly, and there was a notable tolerance of it.

5. The next series in the first group of cases, embraces those in which the duration was between five and ten years. It is worthy of note that I have only four cases in this series, whereas, in ten cases the duration was between ten and forty years. It would seem that the prognosis, as regards a long duration, improves after the disease has existed for ten years. Of the four cases, two were in hospital and two in private practice. In one of the latter cases, the duration was nearly or quite ten years. The age of the patient at the commencement of the disease, was not far from thirty. He came under my observation a few months before his death. He was then suffering much from laryngitis, which interfered greatly with alimentation. This complication, doubtless, contributed to hasten death, by occasioning irritation. The patient was in good circumstances, and studied the best means of prolonging life. He died while spending the winter in Cuba. His habits were in all respects good, and he took alcoholics moderately, if at all. The other patient in private practice became phthisical at about the age of twenty. There was evidence of a strong family predisposition in this case, both parents having had the disease. From the moment that the disease was declared, he sailed for Europe, where he remained a year or so, and subsequently he made several voyages,

and travelled in different countries. He fell into bad habits, especially as regards sexual indulgence. For several years the disease seemed to be in abeyance, but at length, after six years' duration, he declined and died, in the spring, in Minnesota. During these six years he had no object except health-seeking, and there was nothing lacking in pecuniary resources and the solicitude of friends.

Of the two hospital patients, one was a carpenter, and he became phthisical at the age of 31. The date of death in this case was not noted, but the duration was known to have exceeded seven years. The disease had existed four years before his admission into Bellevue Hospital, and he was under my observation afterward for three years. He had had, prior to his admission, as many as forty attacks of hæmoptysis. During the great part of the three years after his admission he worked at his trade more or less, now and then laying up for a few days or weeks. During these years he served to illustrate cavernous signs (cavernous breathing, cracked-metal resonance, and pectoriloquy) to a large number of students in auscultation. His habits had been intemperate, and he was generally allowed a few ounces of spirit daily. The immediate cause of death, as well as the date, is not noted. The other hospital patient was a laborer. The age is not noted. The disease had existed for three years at the date of his admission into Bellevue Hospital. Death took place three years and four months after his admission. During this latter period he was under my observation; and during this period, owing to the shrinking of the upper lobe of the right lung, the heart became dislocated to the right of the sternum. Cavernous signs existed at the summit of the chest on both sides, and large cavities were found on examination after death. During much of the time he was employed as either a ward-keeper or an assistant to the gate-keeper of the hospital. His habits are not noted.

A comparison of these four cases with reference to events or circumstances which may be supposed to have tended to prolong the disease, leads to about the same conclusions as those drawn from the facts in the preceding series of seven cases. There is no evidence of influence belonging to age, situation, occupation, or habits of life; and it can only be said that, for reasons which are not apparent, the disease was slowly progressive, and well tolerated.

An analysis of the series of cases (9) in which the duration was between three and five years, gives the following facts: The ages, with one exception, in seven cases (in two cases not noted) were between eighteen and thirty-one years; in the excepted case the age was fifty-four years when the phthisis occurred. Two were hospital cases, and the remaining seven cases were in private practice. Five were males and four females. The occupations in the five male cases were, portrait painter, tailor, physician, architect, and bartender. The habits, as regards intemperance, were good in all the cases in private practice. It may be inferred that the bartender was intemperate, but nothing on this point is noted. This was a hospital case. Excepting the two hospital cases, all the patients were in comfortable circumstances. In all these cases changes of climate were resorted to. The portrait painter, as soon as the disease was declared, removed from the north to Florida, and remained there until shortly before his death (four years). One of the female patients died at the South. Another female patient removed from Western New York, first to Virginia, her native State, and afterward to Dunkirk, on Lake Erie. The tailor went to Europe, and remained several months. The physician spent a year or so in England. The architect was a year and a half in Europe. A female patient was seven months at the South. In contrast with these facts in the cases in private practice, the two hospital patients were in Bellevue Hospital, one for a year and a half, and the other for two years, before death. One of the latter cases, the female patient, kept the bed for an entire winter, and improved so as to be up and about the ward during the following summer, never, however, going out of doors. Hæmoptysis occurred in four of the nine cases, and in the remaining five cases its occurrence is not noted. Chronic laryngitis existed in three of the cases; in no instance, however, interfering materially with deglutition. The histories appear to show death by slow asthenia in all the cases, and in one case only were complications, other than laryngitis, noted. In this case there were ulcers in the ileum and cæcum, with lardaceous liver, kidneys, and spleen, the patient having had syphilis.

In so far as events or circumstances tending to prolong the disease in fatal cases of phthisis are embraced in the foregoing analysis, they show that a prolonged duration is due to slowness of the progress of the pulmonary disease, absence of complications which contribute to a fatal result, and an unusual tolerance. As regards the latter, *i. e.* tolerance, the circumstances which pertain thereto have been considered in connection with the analysis of the cases of "slowly progressive phthisis. (*Vide* page 252 *et seq.*) I shall now bring into comparison with the foregoing analysis of the group of fatal cases having a duration of from three to forty years, the results of an analysis of the group of cases in which death occurred within a year from the commencement of the disease. This group embraces two series of cases, namely, First, cases ending between six months and a year, and, Second, cases ending within six months.

1. The first of these two series embraces 19 cases. Of these, eleven were in private, and three in hospital, practice. The two sexes are nearly equally represented, ten were males, and nine females. Of the 9 male cases, the occupations were as follows: clerks, 2; laborers, 2; joiner, merchant, agent, weaver, stonecutter, of each 1. The ages, noted in 15 cases, were as follows: 42 years, one case; 40 years, one case; 37, one case; 35, two cases; between 25 and 30 years, one case; between 20 and 25 years, inclusive, eight cases, and 17 years one case. In ten of the cases the habits as regards intemperance were good, and in none of the remainder of the cases is anything noted in respect to this point. In four of the nine female cases the disease was developed during pregnancy. With reference to complications, diarrhœa was a prominent symptom in six cases; in one case there was pleurisy with effusion in addition to diarrhœa; in another case, in addition to diarrhœa, there was cystitis with strictures of the urethra, the patient having had syphilis, and in one case chronic laryngitis existed. Events or circumstances which may be supposed to have been the immediate causes of death were as follows: Choleraic diarrhœa, during the prevalence of epidemic cholera, causing collapse, was the cause of death in one case. In one case death was preceded by cephalalgia, delirium, and coma, symptoms denoting meningitis; and in another case the existence of recent meningitis was ascertained by post-mortem examination. In the latter of these

two cases, the lungs presented only miliary tubercles, and death took place shortly after a premature confinement. In one case death followed shortly after repeated and profuse hæmoptysis. In nine of the cases no important complication, affecting unfavorably the prognosis, was noted, nor any event or circumstance, irrespective of the phthisis, determining death.

2. The second series, that is, the ending being within six months, embraces 23 cases. Of these cases, 11 were in private, and 12 were in hospital, practice. Four were females and nineteen males. The occupations noted of the male patients, are as follows: Manufacturer of mill-stones, 1 case; joiner, 2 cases; merchant, printer, seaman, boatman, cooper, plasterer, dyer, clerk, each 1 case, and laborer, 2 cases. The ages were noted in 20 cases. In 5 cases the ages were under 20 years, in 1 case 18, in 2 cases 16, and in 2 cases 19 years. In 4 cases the ages were between 20 and 25; in 3 cases between 25 and 30; in 1 case between 30 and 35; and in 5 cases between 35 and 40; in 1 case 41, and in 1 case 66 years. The habits of the patients, as regards intemperance, were good in 12 cases; two patients were hard drinkers; two were moderate drinkers, but one of these had been intemperate, and another patient had been intemperate, but quit drinking some months before the development of the disease, and in 6 cases the habits were not noted. In none of the four female cases in this series was the disease developed during pregnancy; but, with the exception of a single case, the female patients were unmarried. With reference to complications, and events or circumstances, irrespective of the phthisis, determining death, the facts noted are as follows: Laryngitis existed in three cases, but it does not appear from the histories that it interfered with alimentation. Peritonitis occurred in one case, and was the cause of death. Death followed speedily pleurisy with effusion in one case. In one case pneumonia was the cause of death, aortic lesions with enlargement of the heart existing in this case. In two cases profuse hæmoptysis occurred, when the patients were in fair health, and recurrences after short intervals took place, each case ending fatally in four months, the physical signs showing much solidification of the lung. In another case the patient, a girl aged 18, did not consider herself ill prior to the occurrence of hæmoptysis, and death took place three weeks afterward. The details of this case are given in Chap. II. (case

No. 1, page 99.) In several of the cases either an autopsy or the physical signs showed a large amount of disease with cavities, the death not being due to any complication. These were cases of so-called "galloping consumption," this term denoting a notably rapid progress of the disease, which destroys life *per se*, that is, without any grave complication. Cases of this kind are not to be confounded with those of acute miliary tuberculosis. The latter are not embraced in these two series. In two cases, however, the autopsy showed, in addition to small cavities in one case, and to an abundant exudation without cavities in the other case, miliary tubercles in very great abundance. It might be said of these cases that acute supervened on chronic phthisis. These are cases which may illustrate the danger to consumptives, which Neimeyer expresses by saying that they are apt to become tuberculous. Were such cases frequent, they would render probable the hypothesis that miliary tubercles are developed secondarily to, and are dependent upon, the absorption of degenerated morbid products in the lungs of prior date; but such cases are not frequent.

What complications, events, or circumstances in the second group of cases may be supposed to have tended to shorten the duration of the disease, and to have determined death?

Of the 42 cases, 22 were in private, and 20 in hospital practice. These numbers are not far from equal, but in my collection of cases those in private are nearly twice as many as those in hospital practice. Taking this fact into account, the conclusion is, that cases which end after a short duration, occur oftenest in hospital practice. This conclusion is in accordance with the facts in the first group of cases, 16 of this group of 23 cases being in private practice.

Of the 42 cases, 29 were males and 13 females. In my collection of cases the number of male patients is about three times greater than that of female patients. In so far, therefore, as any conclusion may be drawn from the relative proportion of the sexes in this group, it is, that a short duration is more frequently represented by men than by women. Here, too, this conclusion accords with the facts in the first group, 18 of the 23 cases in that group being male patients.

In the male cases of the second group, numerous occupations are represented each by a single case, namely, joiner, agent, weaver, stonecutter, manufacturer of mill-stones, printer, seaman, boatman, carpenter, plasterer, and dyer; four patients were laborers, two were clerks, and two were farmers. These facts certainly do not show any influence derived from particular occupations in shortening the duration of the disease; and the number of occupations represented in the first group show that a similar statement holds true with regard to the influence of occupation in prolonging the disease.

As regards age, of the 35 cases in which it was noted, in 14 it was 30 years or over, the maximum being 66 years; and in 6 cases the age was between 15 and 20 years. Thus, it appears that death after a short duration, in cases of chronic phthisis, is nearly as likely to occur in patients who are over, as in those under 30 years of age. On the other hand, the facts respecting age in the first group of cases, showed that in nearly two-thirds (14 of 19 cases) the patients were under 30 years when the disease became developed.

The habits, as regards intemperance, were noted in 27 of the cases in the second group. The habits were good, in this respect, in 22 of these 27 cases. In two cases the patients were hard drinkers; two drank moderately, and one patient had been intemperate, but had quit drinking some months before the development of phthisis. The facts noted on this point in the first group, give a somewhat larger proportion of those whose habits were not temperate. Of 17 cases, the habits were good in 12; two patients were intemperate, and three drank very freely.

Among the circumstances affecting duration, the fact of the development of phthisis during pregnancy is noteworthy. This was true of four cases in the second group.[1]

Diarrhœa was a prominent symptom in 6 cases; pleurisy with effusion existed in 2 cases; cystitis in 1 case; meningitis in 2 cases; peritonitis in 1 case; pneumonia, with valvular lesions of the heart in 1 case, and one patient died in collapse from choleraic diarrhœa. In 4 cases the disease progressed rapidly after the occurrence of profuse hæmoptysis.

In 11 of the foregoing cases, the short duration was due in a great measure, or chiefly, to affections added to the pulmonary disease. This was true of four or five only of the cases in the first group.

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[1] On revising my cases I find a fifth case, which was overlooked, of phthisis developed during pregnancy and death taking place soon after confinement.

I do not reckon chronic laryngitis as affecting unfavorably the duration. This complication occurred in an equal number of the cases in the two groups.

The conclusions drawn from the foregoing analysis and comparison, with reference to complications, events, or circumstances determining death after a short duration of phthisis, may be summed up in the following propositions:—

1. Fatal cases of phthisis are of short duration in women, oftener than in men.

2. Occupations appear in this collection of cases to have had little or no influence either in prolonging or shortening the duration of phthisis.

3. Patients who become phthisical after thirty years of age are more likely to die after a short duration than those under this period of life, and, *per contra*, phthisis is more likely to be prolonged in patients who are under thirty years of age.

4. Death after a short duration of phthisis, does not occur oftener in patients who are intemperate, or who use alcoholics freely, than in those who are temperate in this respect.

5. In a certain proportion of the cases of phthisis, the short duration, and the causes determining death, relate to important complications, such as pleurisy with effusion, pneumonia, peritonitis, meningitis, and intestinal disease.

6. Phthisis developed during pregnancy is apt to end fatally after a short duration.

7. Death after a short duration in certain cases of phthisis, is due to pathological conditions which are either coincident with, or directly follow, profuse bronchial hemorrhage.

8. In a certain proportion of fatal cases of phthisis having a short duration, death is attributable to the amount of pulmonary affection and the rapidity of the phthisical processes. These are properly cases of so-called "galloping consumption."

9. There is ground for the belief that, in rare instances, death, after a short duration in phthisis, is due to the rapid production of miliary tubercles in great abundance; in other words, to acute tuberculosis superadded to the chronic affection.

10. The duration in fatal cases of phthisis is diminished by an unusual intensity of constitutional disturbance, as denoted especially by a high temperature of the body, and frequency of the heart's action; and it is also diminished by defective alimentation from notable impairment of appetite and digestion.

Facts sustaining the last proposition have not entered into the numerical analysis of the second group of cases; but the facts are exemplified in the histories of some of these cases. These cases ended fatally after a short duration, without important complications, without events or circumstances determining death, aside from those embraced in this proposition, and without a very great amount of pulmonary disease.

Intensity of persistent fever is a prognostic not only of a fatal termination, but of a short duration of phthisis; and this circumstance has no constant relation to the amount of the pulmonary affection. I should take pains to cite clinical evidence, derived from my cases, of the truth of this statement, were the truth of the statement not already generally recognized.

Innutrition and emaciation resulting from defective appetite and digestion, shorten the duration of the disease by impairing tolerance. Certain cases are characterized by anorexia more or less complete. It would be easy to illustrate the significance of this prognostic, as regards not only the fatal termination, but the duration of the disease. This circumstance, like the preceding, has no constant relation to the amount of the pulmonary affection. It is foreign to my present object to consider the pathological explanation of this circumstance. An interesting and important question is, does it depend on the functional relations of the digestive organs, or on degenerative changes in the gastro-intestinal glands? As a basis for an answer to this question, a series of carefully conducted examinations, made as soon after death as practicable, of the gastro-intestinal glands, is a great desideratum.

Of the cases ending fatally, between one year and three years, I shall give simply a summary of facts derived from the histories containing information concerning complications, and the events and circumstances affecting the duration. The number of cases the histories of which contain information on these points is 34.

In one of these cases death was due to pneumothorax from perforation of lung. This accident occurred in several cases, ending either under a year or over three years. They were excluded from these two groups of cases, inasmuch as the occurrence of perforation had been considered in the preceding chapter. (*Vide* page 145 *et seq.*).

Chronic laryngitis was noted in three cases. This complication has also been considered in the preceding chapter. (*Vide* page 124 *et seq.*). In one of the cases in this group it interfered considerably with the ingestion of food.

In four cases notable increase of the gravity of symptoms, and death after a short period, followed profuse hæmoptysis.

Diarrhœa was more or less prominent as a symptom in nine cases.

Uræmic coma preceded death in two cases, and in another case albuminuria and general dropsy existed.

Lobar pneumonia was the cause of death in two cases, albuminuria and general dropsy existing in one of these cases.

Death in one case was preceded by double vision, vomiting, slowness of pulse, and coma; these symptoms being considered to denote cerebral meningitis.

In thirteen cases no important complication was noted, nor any event or circumstance particularly determining death, the disease involving more or less extensive damage of lungs, with defective tolerance from impairment of the appetite and of the processes of assimilation, the mode of dying being by asthenia.

CHAPTER V.

TREATMENT.

Treatment of acute miliary tuberculosis—Treatment of fibroid phthisis—Review of cases ending in recovery, cases of arrested or non-progressive, and of slowly-progressing phthisis, for evidence of an intrinsic tendency in phthisis to end favorably—The objects of treatment—Modes of estimating the influence of particular remedies or measures of treatment—Treatment of cases ending in recovery—Abstracts of the histories of fifteen of these cases in which the treatment consisted of hygienic measures—Abstracts of the histories of eight of these cases treated with cod-liver oil, hypophosphites, or alcoholics—Abstracts of the histories of nine of these cases, of which the notes are defective as regards treatment—Summary of results of the study of forty-four cases ending in recovery, respecting treatment—Treatment of cases in which the disease was arrested or non-progressive—Abstracts of the histories of six of these cases in which there was neither hygienic nor medicinal treatment—Abstracts of the histories of ten of these cases in which the treatment consisted of hygienic measures—Abstracts of eleven of these cases treated with cod-liver oil, hypophosphites, or alcoholics—Abstracts of the histories of four of these cases, the notes of which are defective as regards treatment—Summary of results of the study of the thirty-one cases of arrested or non-progressive phthisis, with reference to treatment—Treatment of ten cases of slowly progressing phthisis—Summary of the treatment in these cases—Treatment of fatal cases—Abstracts of the histories of sixteen of these cases in which there was no important hygienic nor medicinal treatment—Analysis of these sixteen cases, and comparison with the cases not having had treatment, among those ending in recovery, or arrested, or slowly progressing—Abstracts of the histories of twenty-two fatal cases, the treatment of which consisted of hygienic measures—Analysis of these twenty-two cases—Comparison as respects duration and tolerance with the fatal cases in which there was no treatment—Analysis and comparison of all the cases in the collection in which the treatment consisted of hygienic measures—Abstracts of the histories of twenty-four fatal cases, treated mostly with the cod-liver oil—Analysis of these cases, and comparison, as regards duration, with cases receiving hygienic but not medicinal treatment—The usefulness of cod-liver oil shown by improvement and tolerance under its use—Abstracts of the histories of three of the fatal cases treated with the hypophosphites—Abstracts of the histories of three fatal cases treated with alcoholics in large quantity—Treatment, with the iodide of potassium, of cases in hospital with syphilitic complications—Cases treated with bloodletting—Abstracts of the histories of four fatal cases, the notes of which are defective as regards medicinal treatment—Account of six cases treated with the chlorate of potassa—Recapitulation of conclusions drawn from the study of fatal cases with respect to treatment—Treatment in cases the histories of which are defective as regards either duration or termination—Abstracts of the histories of eighteen cases in which there was neither hygienic nor medicinal treatment—Analysis of these eighteen cases—Abstracts of the histories of twenty-two cases in which the treatment consisted exclusively, or chiefly, of hygienic measures—Analysis of these twenty-two cases—Comparison of this group of twenty-two cases with the preceding group of eighteen cases—Abstracts of the histories of fifteen cases in private practice, treated with cod-liver oil—Analysis of these fifteen cases—Abstracts of the

histories of twenty-nine cases in hospital practice, treated with cod-liver oil—Analysis of these cases, and comparison with results of the analysis of the fifteen cases in private practice treated with cod-liver oil—Abstracts of the histories of ten cases treated with the hypophosphites—Analysis of these ten cases—Abstracts of the histories of five cases treated with alcoholics given largely—Treatment of a case thirty years ago —Case treated with the pancreatic emulsion—Summary of the treatment with cod-liver oil, the hypophosphites, and alcoholics—Summary of hygienic treatment—Analysis with reference to temporary change of climate—Influence of particular climates—Relative advantages of different climates—Analysis with reference to change of habits from those more or less sedentary and confining within doors, to those involving out-of-door life and activity—Analysis with reference to change of residence, either from the city to the country, or to a different climate—Remarks on the treatment of phthisis—Arsenic—Hypophosphites—Cod-liver oil—Pancreatic emulsion—Alcoholics—Dietetic treatment—Tonics—Change of habits as regards out-of-door life—Injury of over-exercise—Cold bath—Clothing—Change of climate—Travelling—Case illustrative of the influence of change of climate and travelling on horseback—Sea voyages—Expectorants and cough palliatives—Influence of marriage on the disease—Abstracts of the histories of fifteen cases in which men affected with phthisis married—Analysis of these cases—Abstracts of the histories of two cases in which women who were phthisical married—Conclusions.

AN essential prerequisite for judging accurately of the influence of therapeutical measures in any disease, is the knowledge of its intrinsic tendencies as regards termination either in death or recovery, its duration, complications, etc. This knowledge can be acquired only from the study of the natural history of the disease; a study which requires the collection of a sufficient number of recorded cases in which the disease has pursued its course under favorable external circumstances, without having been influenced by any active measures of treatment. Acute miliary phthisis, bearing in mind the sense in which this term is here used (*vide* page 181), tends intrinsically to end fatally after a short duration, irrespective of complications which may occur. I have no facts which show the possibility of recovery when notable embarrassment of respiration, high temperature, frequency of pulse, etc., are associated with a large accumulation of miliary tubercles or granulations in the lungs. If the existence of the latter have been inferred in a case which recovers, we are bound to conclude the diagnosis to have been erroneous. Assuming this view to be correct, the treatment of acute miliary phthisis embraces only palliative measures, and I pass by this form of disease with these few words. I shall pass by, with an equally brief notice, fibroid phthisis, or cirrhosis of the lungs. My collection of cases furnishes some examples of this form of disease. I have not analyzed them separately with reference to prognosis; but they are characterized usually by a long duration, and they do not tend to a favorable termination. The anatomical changes hardly admit of recovery; and hence, to prevent increase of the lesions, to promote tolerance, and to palliate symptoms, are the objects of treatment. Eliminating this and the acute disease, there remains the ordinary form of phthisis, the anatomical characters consisting of intra-vesicular exudation which undergoes cheesy degeneration resulting in cavities, circumscribed bronchitis, interstitial pneumonia, and pleurisies, associated often with miliary tubercles in more or less abundance. My clinical studies with reference to treatment will have reference to the latter form of disease.

It is undoubtedly true that, in the majority of cases, phthisis, treated in different ways, and without any active treatment, ends in death after a duration which varies within wide limits. The intrinsic tendency in these cases is to a fatal termination. Is this the tendency in all cases? Facts warrant a reply to this question in the negative. Recovery takes place in a certain proportion of cases. This was the termination in 44 cases in my collection. Now it will be seen that in a considerable proportion of these cases, there was no medicinal treatment which can rationally be supposed to have had any special or controlling influence over the disease. The disease, therefore, in some instances, tends intrinsically to recovery. Moreover, as appears from facts developed in the preceding chapter, the disease ceases spontaneously in some cases when the lesions do not admit of complete recovery, and it is probable that the instances in which arrest and recovery take place would be more numerous were it not for certain complications, accidents, and intercurrent affections. That phthisis may end favorably, irrespective of any special medicinal treatment, is a truth which, if I mistake not, is not sufficiently appreciated. It is a truth of great importance in endeavoring to judge of the influence of therapeutical measures. I will, therefore, review the cases of recovery from phthisis, detailed in the preceding chapter, with reference to the proof of an intrinsic tendency to a favorable termination.

1. In case No. 1 (page 187), characterized by the expectoration of a large number of pulmonary calculi, there was no medicinal treatment, and no change of habits of life except that the patient diminished his labor as a farmer.

2. In Case No. 2 (page 187), there was no medicinal treatment; the patient relinquished a sedentary life, spent two months in the country, devoting himself to out-of-door sports, and subsequently there has been no symptomatic evidence of pulmonary disease.

3. In Case No. 3 (page 188), the only remedy prescribed was the citrate of iron and quinia, which was taken for a short time. The patient relinquished the business of a compositor, and after a brief vacation became a salesman in a paper warehouse.

4. In Case No. 4 (page 188), the patient, a physician, continued in practice, and it is not noted that any medicinal treatment was employed.

5. In Case No. 5 (page 188), recovery took place after the patient had graduated in medicine, and while he was engaged in an active country practice. No medicinal treatment is noted.

6. In Case No. 7 (page 189), the only medicinal (?) treatment was cod-liver oil for several weeks. The patient was a constable, and continued in the duties of his calling.

7. In Case No. 8 (page 190), speedy recovery took place without any medicinal treatment, the patient, a clerk in a clothing store, making no change in his occupation or habits of life.

8. In Case No. 14 (page 193), recovery took place without any medicinal treatment, or any material change in habits of life, the patient, a physician, continuing in practice.

9. In Case No. 15 (page 194), recovery took place without medicinal treatment, stimulants being taken freely, as they had been prior to the disease, the only important change being a temporary relinquishment of medical practice, and a sojourn at Philadelphia during a winter lecture term.

10. In Case No. 16 (page 195), recovery took place without medication, under the moderate use of whiskey.

11. In Case No. 19 (page 196), the patient, a medical student, quit attendance on lectures, and recovered without any medication, being much in the open air, and taking whiskey very moderately.

12. In Case No. 20 (page 197), the patient recovered without any material change in habits of life, the only remedies taken being some cough palliatives.

13. In Case No. 21 (page 197), recovery took place without any medication, excepting remedies for diarrhœa, the patient

taking sea voyages, travelling abroad, and living much out of doors. In this case the physical signs denoted a considerable amount of disease.

14. In Case No. 23 (page 198), recovery took place without medication, and with no material change in habits of life.

15. In Case No. 24 (page 199), recovery took place without medication excepting a cough palliative, and with no material change in habits of life, the patient, several years afterward, having a recurrence of the disease which proved fatal.

16. In Case No. 26 (page 200), recovery took place without medication, the patient having a brief vacation with change of climate, his business (bank clerk), involving confinement within doors.

17. In Case No. 29 (page 202), recovery took place without medication, the patient going abroad, and on his return, changing his residence from New York to Minnesota.

18. In Case No. 31 (page 203), recovery took place with the use of some tonic remedies only, the patient (who was a clerk) getting more out-of-door life than previously, and taking a voyage to Europe.

19. In Case No. 32 (page 204), the patient, a homœopathic practitioner, recovered without remedies, taking a voyage to Europe.

20. In Case No. 33 (page 204), the patient recovered without medication, taking alcoholic stimulants moderately, and removing from New York to Minnesota.

21. In Case No. 34 (page 205), the patient, a physician, took the hypophosphites for a short time with no apparent benefit. He took alcoholic stimulants moderately. The symptoms in this case, at one time, seemed to indicate a hopeless condition.

22. In Case No. 35 (page 207), recovery took place without medicinal treatment, and with very little change in habits of life.

23. In Case No. 40 (page 210), recovery took place without medication, excepting a cough palliative, the patient passing the winter in the mountains of Pennsylvania. He subsequently died from recurring phthisis.

From the foregoing review it appears that, of 44 cases of recovery from phthisis, in 23 this termination was in no measure attributable to medicinal treatment, and in several cases there was no material change in the habits of life. The disease ended in recovery, therefore, from an intrinsic tendency thereto. A single case of recovery, without either remedies or any change in the habits of life, would be sufficient to prove such a tendency; but it is here exemplified in more than one-half of the cases of recovery. Moreover, of the 21 cases which are not cited as exemplifying this tendency, in some the histories are defective in information respecting treatment, and in others the remedies used could hardly be considered as exerting any potential influence on the disease, and hence it may reasonably be supposed that this tendency was involved in most, if not all, of the cases. It may thus be assumed as established, that in a certain proportion of cases, phthisis ends in recovery of its own accord—that is, irrespective of medicinal treatment, or any extrinsic influence.

This conclusion is corroborated by a reviewal of the histories of the 31 cases given in the preceding chapter (page 219 *et seq.*), under the heading "cases of arrested or non-progressive phthisis." Of these 31 cases, in 15 the histories show that the disease became non-progressive without medication, and, in several of the cases, without any material change in habits of life. It is a noteworthy coincidence that the proportion of cases thus showing arrest or non-progression from an intrinsic tendency in this group of cases, corresponds with the proportion in the group of cases ending in recovery. In the former, as in the latter, group, the histories of the cases which are not reckoned as showing an intrinsic tendency to become non-progressive, are, in general, either defective in information concerning treatment, or the remedies employed could hardly be considered as having any potential influence on the course of the disease.

Further corroboration is obtained by reviewing the cases of "slowly progressing phthisis" (page 243 *et seq.*). It is reasonable to conclude that there is comparatively little intrinsic tendency to a fatal termination when the duration of the disease extends over a period of from four to forty years in cases not receiving any medicinal treatment, excepting, perhaps, some tonic and palliative remedies. This was true in six of the ten cases detailed under the heading just quoted; and among these six cases are some in which there was no material change in the habits of life.

The first object in the treatment of phthisis, of course, is recovery; the second object is the arrest of the disease, although complete recovery may not follow; and when these two objects are unattainable, it remains to promote retardation of progress and tolerance. Now, with reference to knowledge of measures of treatment for these ends, it is vastly important to take cognizance of the fact that recovery, arrest, slowness of progress, and tolerance, may take place without medication and without any material change in habits of life. In judging of the agency of measures of treatment in this disease, here is an element which certainly has not been sufficiently recognized. In the instances of recovery, of non-progress and of prolonged duration of phthisis, this element—that is, an intrinsic tendency—has been in a great measure ignored, and the ends of treatment have been considered as effected by means of the remedies or the hygienic measures which in most of such instances have been employed. The number of cases in my collection in which there was no important treatment is remarkable, and these cases are of much value in demonstrating, in the natural history of phthisis, a truth which underlies the treatment, namely, the disease, in a certain proportion of cases, irrespective of treatment, ends in recovery; in another proportion it ceases to progress, and, in other cases, it progresses very slowly.

The recognition of an intrinsic tendency toward recovery renders it difficult, in the study of any disease, to estimate the efficacy of measures of treatment. In the cases ending favorably in which measures of treatment were employed, how much is to be accorded to the measures, and how much to the intrinsic tendency? We cannot judge of the latter element in the history of a disease by the relative proportion of deaths and recoveries. A disease may end fatally from an intrinsic tendency, in a very large proportion of cases, and yet the tendency to recovery may be strong in a small proportion of cases. The latter statement is a fair inference from the study of some of my cases of phthisis ending in recovery, or ceasing to progress. Whatever knowledge can be gained of the circumstances which either stand in a causative relation to, or are the indications of, a tendency to cessation of progress and recovery, is to be obtained by an analytical study of the cases in which recovery has taken place, and those in which the disease has become non-progressive; in other words, the circumstances betokening a tendency to arrest and recovery, or those on which a favorable prognosis is to be based. The conclusions drawn from the analytical study of my cases with reference to this point of inquiry are contained in the preceding chapter. (*Vide* page 253.)

Proceeding to the consideration of the treatment of phthisis, how is the influence of particular remedies or measures, respectively, to be determined? As just seen in cases progressing favorably, there is an element, namely, an intrinsic tendency, which cannot be estimated with accuracy, and, therefore, the relative agency of this tendency, and of a remedy, or of any therapeutic measure, cannot be demonstrated. The problem is, of course, still more difficult in cases in the treatment of which several remedies and measures of treatment were associated, it being necessary, in these cases, to determine, in addition, the relative agency of each remedy or measure. On the other hand, in cases which progressively go on to a fatal termination, there is an intrinsic tendency to progress in that direction, or to serious complications, and here, too, is an element which cannot be estimated with accuracy. In proportion as this latter element is large in any case, will the influence of treatment be small or *nil.* It might at first seem a fair method of investigation to compare a certain number of cases ending in recovery without medication, with an equal number of cases treated solely by a particular remedy, in order to determine the therapeutical influence of the remedy. But it is certain that by this method the remedy would be shown to be injurious rather than useful, for, undoubtedly, in the great majority of cases, phthisis will end fatally under any remedial treatment now or hitherto in vogue. For the fairness of such a comparison, there must be in all the cases complete uniformity in circumstances relating to amount of disease, the appetite, digestion, constitutional disturbance, etc., irrespective of that indeterminable element expressed by the term intrinsic tendency. To meet this requirement is almost, if not quite, impracticable. With the most abundant clinical opportunities continued for a long period, no observer could gather a sufficiently large number of recorded cases to carry out fully this plan of study. Some approximation thereto is all that any one can expect to accomplish. Another source of information is more available, namely, observation of the apparent immediate influence of a remedy, comparing, in this regard, the influence of different remedies successively employed, and also observing the effect of suspending all remedies in the same case.

This method of study has difficulties and is open to error, but it has a certain value, and is almost the only resource for original observation with those whose clinical opportunities are limited. As my object in these few remarks is only to touch upon some of the difficulties in the way of therapeutical investigations relating more particularly to phthisis, I do not notice, among other things, the liabilities to error arising from unskilfulness in diagnosis, want of accuracy in observation, mental bias, etc.; and I shall now interrogate my cases with reference to certain remedies and measures of treatment, offering such conclusions as seem rational in view of the facts contained in the histories. There are many remedies employed in cases of phthisis, which, although more or less useful, cannot be supposed to exert any potential influence on the disease. Such are palliatives of cough, of sweating, etc., and various tonic medicines. I shall confine my analyses to the following remedies—cod-liver oil, the hypophosphites, and alcoholics when given in considerable or large quantity. Measures of treatment aside from medicines, will relate especially to habits of out-of-door life and activity, temporary and permanent changes of climate, travelling and sea voyages. We may distinguish the latter as constituting the hygienic treatment in distinction from the use of remedies or the medicinal treatment.

I shall consider the treatment, medicinal and hygienic, *first*, of cases ending in recovery; *second*, of cases in which the disease was arrested or became non-progressive; *third*, of cases in which the disease was slowly progressive, and *fourth*, of fatal cases.

Treatment of Cases Ending in Recovery.

Out of 44 cases ending in recovery, as has already been seen, (page 274), in 23 there was no medicinal treatment of importance, in some no remedies whatever having been taken, and in the other cases only some cough palliatives and simple tonic medicines. In 8 of these 23 cases, not only was there no medicinal treatment of importance, but there was no material change in the habits of life; in other words, there was no hygienic treatment, the recovery taking place without any appreciable influence brought to bear upon the disease, and, therefore, purely from an intrinsic tendency. Were there any circumstances in these eight cases which may be considered as peculiarly favorable to recovery? Five of the patients were men, and three women. Of the female patients, one was a school teacher, her duties confining her quite closely within doors. The other two female patients were sisters; both parents had been tuberculous, and a sister and two brothers had died with phthisis. These two sisters were all who remained of the family. They recovered without any material change in habits of life, whereas, no efforts had been spared to save the lives of their sister and brothers, travelling, changes of climate, together with remedies, having been resorted to in vain, although, perhaps with the effect of retarding the progress of the disease. Of the five male patients, one was a farmer, one was a constable, two were practitioners of medicine, and one was a clerk in a clothing store. All were temperate as regards the use of alcoholics. All were under 30 years of age. In all the tuberculous affection was small or moderate in amount. Aside from the latter fact, there was nothing in the circumstances rendering the prognosis in these eight cases peculiarly favorable.

In 15 of the 23 cases, hygienic measures constituted the treatment. The measures of hygiene in the cases seriatim, briefly stated, were as follows:—

1. Relinquishment of study, as a medical student, together with occupation in telegraphing, for rural sports for a time, and afterward medical practice as an army surgeon.
2. Several weeks of country life, and afterward exchanging the business of a compositor for that of a salesman in a paper warehouse.
3. Leaving school teaching, attending medical lectures, and engaging in country medical practice in Kentucky.
4. Relinquishing medical practice temporarily, attending medical lectures for two consecutive winters in Philadelphia, and then returning to medical practice in central New York.
5. A female patient obtaining more than previously out-of-door life.

6. Quitting medical lectures and living much of the time in the open air in Texas, his native State.

7. Passing a winter in Florida, and a summer in Minnesota; a voyage to Gibraltar in a sailing ship, and much out-of-door life, after returning, in the vicinity of New York.

8. Voyage to Europe, and, on his return, after a winter at the South, a permanent change of residence from New York to Minnesota.

9. A clerk in a clothing store, confining himself less to the store for some months, and then travelling in Europe.

10. Passed several weeks in the country during the summer season, the patient engaged in business in Brooklyn.

11. Removal from the city of New York to reside permanently in Minnesota.

12. Relinquishing active medical pratice and engaging in rural sports.

13. Diminution of office work, especially at night, and more recreation, the patient being an editor of a daily paper.

14. A sea voyage to and from Liverpool, as surgeon of a steamship, and afterward returning to a country practice in Massachusetts.

15. Suspension for several months of the duties of a clergyman, and a sojourn in Egypt.

It thus appears that in these 15 cases, the hygienic measures consisted of, in all, with perhaps a single exception, change of habits as regards out-of-door life. The extent of this change varied much in the different cases; but in most it was either considerable or great, involving travelling abroad, sea voyages, occupation most of the time in the open air, and a permanent removal to another climate. In the excepted case (No. 13) it does not appear that there was any material change beyond diminishing night work as an editor, and giving time to recreation. Now, how much influence is to be ascribed to these measures in determining recovery? This question cannot be answered with any positiveness in view of our inability to appreciate and measure an intrinsic tendency to recovery. We may rationally attribute to the measures a certain amount of influence, for it is by no means probable that all these fifteen cases would have ended in recovery purely from an intrinsic tendency thereto. We must be satisfied with this conclusion, and, practically, it is hardly less satisfactory than if we could answer the question with greater precision; for, in the management of individual cases, the important point is to know that certain measures will increase the chances of recovery. We can never expect to be able to express with anything like mathematical exactitude the amount of this increase. We conclude, then, that, while undoubtedly phthisis may end in recovery without either medicinal or hygienic treatment, the measures which entered into the histories of these fifteen cases exerted a certain amount of influence in determining the ending.

With regard to other measures of hygiene, it should be added that in none of these cases were there any dietetic restrictions, but, on the contrary, a generous alimentation entered into the treatment. In several of the cases alcoholics were taken moderately. It is noted in one of the cases that the sponge-bath was resorted to daily, both in summer and winter, with apparent benefit.

Exclusive of the 23 cases in which recovery took place without any important medicinal treatment, there are 8 cases of which the histories contain information respecting the employment of remedies which may be supposed to have had an influence more or less potential upon the disease, together with hygienic treatment; and there are 9 cases of which the histories are defective in information concerning the remedial, but contain an account of the hygienic treatment. I proceed to give a brief statement of the treatment in these cases seriatim:—

1. Cod-liver oil was taken for a considerable period, and quinia with preparations of iron. Brandy was taken moderately. The patient, a joiner, became a farmer.

2. Cod-liver oil was taken for a considerable period, and alcoholics moderately. The patient, a clerk in a clothing store, became a farm laborer.

3. Cod-liver oil was taken for a short period, and given up on account of its not being well tolerated by the stomach. The treatment then consisted of whiskey, a pint being taken daily for a considerable period. Under this treatment there was notable increase of weight (30 pounds within five months, *vide* Chapter IV., page 192, Case No. 12). No material change was made in habits of life, the patient being a clerk.

4. Cod-liver oil and the hypophosphites were prescribed and

taken for some time. Stimulants were taken moderately. The patient, a planter in Mississippi, lived much out of doors.

5. Cod-liver oil was prescribed, but it is not noted whether it was taken for any considerable period or not. No other medication. The patient travelled, took a voyage to Europe, and changed his habits of life at home, which were sedentary, to those of an active out-of-door business.

6. The hypophosphites were prescribed, but it is not noted how long they were continued. The patient changed his occupation, which was that of an in-door clerk, becoming a travelling agent.

7. The patient, a woman, was under the treatment of a botanic practitioner for the first eight or nine months; she was then at a water-cure for five weeks, and afterward continued the use of the wet-pack at home. She took three gallons of cod-liver oil. Previous to the development of the disease, she was occupied within doors; she afterward changed her occupation to one giving her some out-of-door life. The disease in this case advanced to the formation of cavities. (*Vide* Chapter IV., page 211, Case No. 43.)

8. The treatment in this case consisted in the use of whiskey largely, a pint daily having been taken for two years. No other remedy was employed excepting a palliative of cough. There was in this case notable constitutional disturbance. During the retrogression of the disease the patient, a young woman, was much out of doors. (*Vide* Chapter IV., page 212, Case No. 44.)

We leave it for the reader to divine the amount of influence exerted by the remedies in the foregoing eight cases. We have, in these cases, two indeterminate influences, namely, an intrinsic tendency, and the hygienic treatment. As regards the latter, it is to be noted that in all the cases changes were made involving more or less of out-of-door life. In two of the cases (Nos. 8 and 3), the apparent effect of the alcoholic treatment is remarkable. It is fair to suppose that the cod-liver oil, in the cases in which it was continued for a considerable period, was useful.

In the following cases either the histories are defective in the account of treatment, or it is only noted that different tonic remedies and palliatives were prescribed:—

1. The cod-liver oil was taken for a short period only, on account of its causing gastric disturbance. The other remedies

given were tonics and palliatives. The patient, a married woman, passed two successive winters at the South. After her recovery she gave birth to a healthy child, now living and well, over twenty years of age. A recurrence of the disease subsequently took place, proving fatal.

2. No medicinal treatment is noted. Recovery took place after relinquishing medical practice, and during a sojourn in Europe of from one to two years. Subsequently there was a recurrence of the disease, which ended in recovery, the patient leaving the city of New York, and passing the summer in Newport, R. I.

3. No medicinal treatment is noted. The patient, a merchant in the city of New York, removed to Orange, New Jersey, continuing in mercantile business, and coming into town daily.

4. Medicinal treatment is not noted. The patient left an occupation involving a sedentary life, and went to Europe, where recovery took place.

5. It is only noted in this case that the patient took tonic remedies and stimulants. He spent the summer in Minnesota, and returned well. Subsequently the disease recurred, and proved fatal.

6. It is only noted that tonic remedies were taken. The patient, a married woman, living in New York, travelled in Europe, and, after her return, visited the Western States.

7. No medicinal treatment is noted. The patient, a lawyer, made a voyage around Cape Horn. During the voyage the ship sprang a leak, and he worked daily at the pumps, all the while improving. He afterward settled permanently in California.

8. It is only noted that the patient took atropia as a palliative of cough. He went to the mountains in Lima, South America, and returned well. The disease subsequently recurred, and ended fatally.

9. No medication is noted. The patient, a physician, became phthisical soon after graduation. He went into the country, in Alabama, and practised his profession, riding on horseback.

The noteworthy point in relation to the foregoing nine cases is, there was a notable change in habits of life in every case, the changes involving out-of-door life, travelling, sea voyages, and permanent removal to another climate.

Summing up the results of the clinical study of the 44 cases ending in recovery, they are as follows: In 8 cases there was neither medicinal nor hygienic treatment. In 15 cases there was no medicinal treatment of importance, but the treatment involved hygienic measures, consisting of changes in habits, especially as regards out-of-door life, such as travelling abroad, sea voyages, rural pleasures or pursuits, and a permanent removal to another climate. In 8 cases, remedies which may be supposed to have exerted an influence upon the disease were employed, namely, cod-liver oil, and alcoholics in large quantity. Of these 8 cases, the hygienic measures just named entered, to a greater or less extent, into the treatment. In 9 cases either there was no information of medication in the histories, or the medicinal treatment consisted of only tonic or palliative remedies. Of these 9 cases, the same hygienic measures as in the other cases entered, more or less, into the treatment in all.

The practical facts may be embodied succinctly in the following conclusions: Phthisis sometimes ends in recovery, from an intrinsic tendency, without treatment. Hygienic treatment contributes, probably, in no small measure, to this ending. Cod-liver oil and alcoholics, in certain cases, exert a favorable influence.

Treatment of Cases in which the Disease was arrested or non-progressive.

In the study of this group of cases I shall pursue the same plan as in studying the group of cases ending in recovery. This plan embraces an analysis, *First*, of cases in which there was no treatment of importance, either medicinal or hygienic; *second*, of cases in which hygienic measures enter into the histories without any important remedies; *third*, of cases in which medicinal treatment may be supposed to have had an influence upon the disease; and, *fourth*, of cases the histories of which are defective as regards medicinal treatment.

There was no medicinal treatment of importance, nor any material change in the habits of life in the following 6 cases:—

1. (*Vide* page 220, Case No. 2.) The patient was a married woman. The duration from the date of the development of the disease was nineteen years. She had had no medication

except in attacks of hæmoptysis. She had always attended to her household duties. She did not take alcoholics.

2. (*Vide* page 221, Case No. 3.) This patient was the husband of the preceding patient. The duration was twenty-seven years. He had continued in business successively as an apothecary, a dealer in dry goods, and a grocer. He did not take alcoholics.

3. (*Vide* page 226, Case No. 11.) Duration fifteen years. The only change in habits of life in this case was diminution of labor as a lawyer and a politician. Alcoholics taken very moderately, if at all.

4. (*Vide* page 227, Case No. 12.) Duration twelve years. Alcoholics moderately. The patient, a medical practitioner, continued in practice.

5. (*Vide* page 237, Case No. 29.) The patient, a married woman, took only chalybeate tonics, and for a very brief period arsenic.

6. (*Vide* page 230, Case No. 17.) Duration seven years. The patient, an active business man, took no remedies, and made no material change in habits of life.

Of the preceding group of cases, that is, the cases ending in recovery (44 in number), in eight there was no important medication, and no material change in habits of life. Of the group now being analyzed, 31 in number, six are in the same category. The near correspondence in the ratio is worthy of note.

In the ten following cases there was no medicinal treatment of importance, but hygienic measures may be supposed to have exerted more or less influence in effecting an arrest of the disease.

1. (*Vide* page 224, Case No. 8.) Duration fourteen years. The patient removed to the summit of the Alleghany Mountains, and spent much of the time in the open air on horseback, living generously and taking whiskey moderately. The arrest took place under these circumstances, his weight increasing from 129 to 183 pounds. This case might properly have been included in the list of cases ending in recovery.

2. (*Vide* page 229, Case No. 15.) Duration twenty-four years. The patient passed several winters in the West India Islands, and afterward was much of the time out of doors, after a time

removing from New York city to a country place in New Jersey.

3. (*Vide* page 230, Case No. 17.) Duration five years. For the first two years, during which arrest took place, there was no medication. Afterward, for a time, he took cod-liver oil. The patient, a clergyman, passed the first winter and spring in Nice; the next winter in New York, and a portion of the following summer in the Adirondacks, camping out, and sometimes much exposed, on one occasion walking four miles in water up to his knees, and in some places up to the waist. He took alcoholics moderately, and lived generously.

4. (*Vide* page 233, Case No. 22.) Duration five years. Some tonic remedies only were taken in this case. The patient, a wholesale grocer. He passed the spring and summer months in Europe, and on his return home changed his residence from the city to the country, not resuming his business, but living much out of doors.

5. (*Vide* page 235, Case No. 27.) Duration four years. There was no important medication in this case, except that the patient at one time took morphine freely to allay cough. He travelled in Europe, passed one winter in Nassau, and another in Aiken; made a voyage around Cape Horn, and finally settled on a ranche in Southern California. In his voyage to California, the vessel was wrecked, and he endured considerable hardships.

6. (*Vide* page 234, Case No. 24.) Duration two and a half years. Tonic remedies only were taken. The patient, a young unmarried woman, changed her habits of life in being much out of doors.

7. (*Vide* page 237, Case No. 30.) Duration three years. This patient, a married woman, had no medicinal treatment for two years. During the third year she took cod-liver oil and lime. She passed the first summer after the development of the disease in Minnesota; afterward she spent the winters in New York, and the summers in the country. The signs denoted pulmonary cavities.

8. (*Vide* page 229, Case No. 16.) Duration eight years. Some tonic remedies only were given. Alcoholics were taken moderately. The patient, a young married woman, passed several months in Europe, prior to which, and afterward, living much in the open air.

9. (*Vide* page 232, Case No. 20.) Duration four years. The patient took no medicines, and used alcoholics moderately. He passed four consecutive winters in South Carolina. The lungs at the end of four years denoted cavities.

10. The following case was not included among the cases of arrested or non-progressive phthisis in the preceding chapter, the account of the case, after two years and four months, not having been obtained until since that chapter was written. Mr. B., clerk, aged twenty-one, was examined by me first in January, 1869. He then had unequivocal evidences of tuberculous disease at the summit of the left lung. He was advised to take a sea voyage, and he sailed in February for Marseilles, in a sailing vessel. His improvement during the voyage was very marked. He was previously much emaciated, feeble, and had night sweating. He nearly lost his cough during the voyage, gaining also in weight and strength. He passed the spring in Florence and Rome. On his return to New York, in June, 1862, he had a healthy aspect, and had gained twenty pounds in weight. His appetite and digestion were good. He passed the summer in the Cattskill Mountains, and continued to improve. He then went upon a farm in New Jersey, and in May, 1871, his appetite, strength, aspect, and general condition were good. He had, however, notable dulness on percussion at the left summit of the chest, with bronchial respiration, bronchophony, and moist bronchial rales. He subsequently married and removed to Rhode Island, on the Narragansett Bay, where he still resides (June, 1875). He has two healthy children. His general health is fair, and the pulmonary symptoms are slight. This last account is obtained from his brother. He is on a farm, and his habits are active. There has never been any important medication in this case.

Thus in 10 of the 32 cases in which the disease was arrested or ceased to progress, the treatment was hygienic, without any special or important medication. The two cases in which cod-liver oil was taken two years after the development of the disease, and evidently after it had become non-progressive, are considered as properly embraced in this group. In the group of cases ending in recovery (44 in number), 15 were in this category, that is, the treatment consisted of hygienic measures without medication.

In the following eleven cases remedies were employed, which may be supposed to have had an influence in the arrest of the disease.

1. (*Vide* page 220, Case No. 1.) Duration twenty-five years. Cod-liver oil was taken; it does not appear from the history how long. Alcoholics were taken moderately. The patient was a clergyman, and he carried out the injunction to obtain as much out-of-door life as practicable, by riding on horseback, walking, etc., continuing for several years to perform his professional duties.

2. (*Vide* page 221, Case No. 4.) Duration six months. Cod-liver oil was taken for six weeks, and then discontinued on account of its apparently producing diarrhœa. The use of alcoholics is not mentioned in the history. The patient was a ship carpenter, and at the end of the six months was able to do full work. There was no change in habits of life in this case.

3. (*Vide* page 222, Case No. 5.) Duration five years. Cod-liver oil was taken for a long period, and whiskey moderately. The patient, a young woman, was a seamstress, and she changed her occupation, first, to that of a domestic, which enabled her to be out of doors a portion of the time, and, afterward, to that of a cabin maid in a steamer on Lake Erie.

4. (*Vide* page 223, Case No. 6.) Duration fourteen months. Cod-liver oil was taken for three or four months, and whiskey moderately. The patient, a young woman, was engaged in school teaching when the disease was developed. She suspended this occupation for a month, and the arrest took place during this period.

5. Cod-liver oil was taken, but it is not noted for how long a period. Six ounces of whiskey daily were taken for a year. During this time he discontinued the whiskey for two weeks, and, finding he was not as well, resumed it. At the end of a year he discontinued it without difficulty and with no ill effect. He gained twenty pounds in weight during the year. The patient, a physician, continued in practice, often being exposed to wet on the coast in Louisiana.

6. (*Vide* page 226, Case No. 10.) Duration four years. Cod-liver oil or the head whale oil was taken steadily for two years. The patient, a carpenter, ceased to work at his trade, and had no other occupation. The signs denoted cavities.

7. (*Vide* page 227, Case No. 14.) Duration twelve years. Cod-liver oil was taken for a considerable period, and whiskey, about half a pint daily, for two years. It was then discontinued at the desire of the patient, its use having become a hardship. The first winter after the development of the disease, she was kept within doors in Boston, by the advice of a homœopathic practitioner. The following summer she passed in Minnesota. During the next winter she had undertaken to keep her room, but was induced to consent to be carried out daily, and subsequently spent much of the time in the open air, living in New York in the winter and in the country during the summer.

8. (*Vide* page 232, Case No. 21.) Duration seven years. Cod-liver oil was prescribed, but it is not noted how long it was taken, and the history is deficient in information as to hygienic measures of treatment.

9. (*Vide* page 233, Case No. 23.) Duration two and a half years. This patient, a married woman, had been under no medical treatment, but, for a year, of her own accord, she had taken whiskey freely, the daily quantity not noted. She resided in the country (Orange, New Jersey). It is not noted whether she made any material change in her habits of life, other than taking the whiskey, after the development of the disease. She discontinued the use of whiskey at the end of the year. The signs denoted cavities.

10. (*Vide* page 234, Case No. 25.) Duration four years. Cod-liver oil was taken most of the time for two years or longer, and alcoholics moderately. The patient passed two successive winters in Mentone, under the care of Dr. Bennet.

11. (*Vide* page 238, Case No. 31.) Duration four years. Cod-liver oil and the compound syrup of the hypophosphites were taken in this case, and alcoholics moderately. The patient left New York City in the summer for Vermont, living in the open air, and returned apparently quite well. Subsequently there was a recurrence of the disease, and under the same measures an arrest again took place.

Comparing the number of cases in this category with the number embraced among the cases ending in recovery, the former is considerably larger, the difference being as 11–31 is to 8–44. In 9 of the 11 cases cod-liver oil was taken for a greater or less period. The hypophosphites were taken, together with cod-liver oil in one case. Alcoholics were taken moderately in five cases. They were taken in considerable quantity in three cases, and in one of these cases there was otherwise no medicinal treatment. In two cases there were no material changes in habits of life; in one of these cases the patient was a physician, and in the other case a ship carpenter. In two cases the histories are deficient in information concerning hygienic measures. In the remaining cases, namely, in seven, the treatment embraced measures of hygiene, involving either travelling, voyages, change of climate, or out-of-door life at home.

Of the following four cases the histories do not contain any information of medicinal treatment. It may, or may not, have been employed.

1. (*Vide* page 225, Case No. 9.) Duration seven years. When the disease was developed the patient resided in Boston. He came to New York with a view to a more favorable climate, and was for several years employed as a clerk in the Bellevue and Charity Hospitals, his duties involving in-door and out-of-door duties.

2. (*Vide* page 227, Case No. 13.) Duration six years. The patient, a married woman, went to Mentone shortly after the development of the disease, and was under the care of Dr. James Henry Bennet.

3. (*Vide* page 231, Case No. 19.) Duration two years. The patient went to Florida in the winter, and passed the following summer at Lake George. In the autumn he went to Minnesota, and, not doing well, he left in January and again went to Florida.

4. (*Vide* page 236, Case No. 28.) Duration two years. The patient passed two winters at Mentone under the care of Dr. James Henry Bennet, travelling about Europe during the intervening summer. The signs denoted cavities which, from the absence of cough and expectoration, were considered innocuous.

In the group of cases ending in recovery (44), there were nine cases in which medication was not noted. In the foregoing four cases, as in the nine contained in the preceding group, there were notable changes in habits of life, in three of the four cases change of climate and voyages across the Atlantic entering into the treatment.

Summing up the results of the clinical study of the 31 cases in which the disease was arrested or non-progressive without ending in complete recovery, in six cases there was neither medicinal nor hygienic treatment. In 9 cases there was no medicinal treatment of importance, but the treatment involved hygienic measures consisting of changes in habits, especially as regards out-of-door life, such as travelling abroad, sea voyages, rural pleasures or pursuits, and permanent removal to another climate. In 11 cases remedies which may be supposed to have exerted an influence upon the disease were employed, namely, cod-liver oil, alcoholics in considerable quantity, and, in one case, the hypophosphites. Of these 11 cases, in seven the hygienic measures just named entered into the treatment, the histories in two cases being defective in information on this point, and in the other two cases the occupations involving out-of-door life. In four cases medicinal treatment was not noted in the histories. Of these four cases the hygienic measures entered into the treatment.

In the foregoing summary I have used nearly the same language as in summing up the results of the clinical study of the 44 cases ending in recovery (*vide* page 283), in order that a comparison of the results in the two groups of cases may be more readily brought before the reader.

Treatment of Cases of Slowly Progressive Phthisis.

This group embraces only ten cases. I shall give the facts relating to the treatment in each case, and a summary afterward.

1. (*Vide* page 243, Case 1.) Duration to date of death, fourteen years. Alcoholics were taken moderately, and, from time to time, tonic remedies and palliatives of cough. The patient made two voyages to Europe, and afterward had considerable out-of-door life, although engaged in business in New York.

2. (*Vide* page 244, Case 2.) Duration to date of death, fifteen years. The patient, a physician and medical teacher, took alcoholics pretty freely. No medication otherwise noted. The patient was engaged in medical practice for eleven years, and removed to Southern California four years before his death, with notable benefit.

3. (*Vide* page 244, Case 3.) Duration to date of death, about forty years. Alcoholics were taken only at times, and always very

sparingly. No medication except occasionally tonics, and cough palliatives. The patient, a married woman, made several voyages to Europe and Cuba, passing, when in this country, the winters in either Boston, Philadelphia, or New York, and the summers in the country.

4. (*Vide* page 245, Case 4.) Duration to date of death, twelve years. The patient took alcoholics pretty freely, otherwise there was no medication. He travelled in Europe in the early part of the disease, and went to Europe again in the last year of his life, dying abroad. In the intervening year he engaged in no business, and lived much out of doors, residing in Central New York.

5. (*Vide* page 246, Case 5.) Duration to date of death, fourteen years. No important medication. Travelled in Europe, and on his return to his business (publisher) was more out of doors than he was prior to the development of the disease. Alcoholics were taken moderately.

6. (*Vide* page 246, Case 6.) Duration to date of death, eight years. No medication. Alcoholics taken moderately. Relinquished occupation of clerk, and was much of the time out of doors, walking, boating, etc. Made a voyage to Europe, and engaged for a time in gymnastic exercises.

7. (*Vide* page 248, Case 7.) Patient living two and a half years after date of the development of the disease. Engaged in the business of a fur trader. Lived out of doors in the far west. No important medication.

8. (*Vide* page 249, Case 8.) Patient living five years after the date of the development of the disease. No important medication. Alcoholics taken moderately. Passed the spring months in Cuba, and the summer months in the country near New York. Went to California, and travelled in Europe.

9. (*Vide* page 250, Case 9.) Patient living in fair health ten years after the date of the development of the disease. Tonic remedies only given. The patient was five years of age when the disease commenced. The case was probably one of fibroid phthisis limited to the lower lobe of the left lung. The patient was in humble circumstances, attended school, and there was no special hygienic treatment.

10. (*Vide* page 251, Case 10.) Patient living and in fair health four years and four months after the date of development of the disease. Cod-liver oil was taken, and alcoholics moderately. He

continued in the practice of medicine in Tennessee from one to two years, and then relinquished practice and engaged in the raising of tobacco.

Of these ten cases, in only one was there neither medicinal treatment of special importance, nor hygienic treatment (No. 9); and this was supposed to be a case of fibroid phthisis. In seven of the ten cases there was no medicinal treatment of importance, but hygienic measures, either travelling, sea voyages, change of climate, or more out-of-door life, entered, to a greater or less extent, into the treatment. Cod-liver oil is noted as entering into the treatment in one case, and in this case (No. 10) there was no material change in habits of life excepting that, after a time, the practice of medicine was relinquished for the raising of tobacco. In two cases alcoholics were taken pretty freely, and otherwise no medicinal treatment is noted. Hygienic measures entered largely into the treatment of one of these cases (No. 4). In the other case, the patient continued in the practice of medicine for eleven years (No. 2), and then removed to California.

Treatment of Fatal Cases.

A fatal termination is, of course, proof positive of the inefficacy of treatment with a view to recovery, but is by no means proof against a favorable influence of therapeutical measures. A favorable influence may be made apparent by improvement as regards the local symptoms and the general condition of the patient; and, in the course of the disease, a comparison of periods during which certain measures were employed, with after periods when they were suspended, may render such an influence very evident. In fact, we may obtain, in fatal cases, more convincing proof of the favorable influence of treatment than in cases which progress steadily to recovery; for, in the latter cases, there is always room for the supposition that this progress is due, not to the treatment, but to a strong intrinsic tendency. The evidence of the effect of treatment in such cases is not as strong as where comparison is made with and without certain measures, notwithstanding the cases thus studied eventually prove fatal. Here, then, is one way in which information respecting treatment is to be gained by the study of fatal cases —what is the immediate apparent effect of certain measures of treatment, either medicinal or hygienic, and is the inference with regard to the effect confirmed by making a comparison, as regards the local symptoms, and the general condition, of the periods when these measures were employed, with periods when they were suspended. Again, we may have in the histories of fatal cases, evidence of either arrest or non-progress of the disease for a greater or less period, the disease afterward becoming progressive and ending in death; and the facts in the histories may go to show that the temporary non-progression was due either to treatment, or to an intrinsic tendency, the operation of either, or both, being for a limited time only. The duration of the disease, also, is to be considered in the endeavor to study the influence of treatment in fatal cases. For the sake of conformity, I shall follow the classification adopted in studying the three groups of cases already analyzed with reference to treatment, namely, of those ending in recovery, of those in which the disease was arrested or became non-progressive, and of those in which the disease was slowly progressive. In accordance with this classification, the first series will embrace the cases in which there was no treatment of importance, either medicinal or hygienic; the second series will embrace the cases in which hygienic measures constituted the treatment without any important remedies; the third series will embrace cases in which medicinal treatment supposed to exert sometimes a curative influence was employed, and the fourth series, the cases the histories of which are defective as regards medicinal treatment.

The histories of a considerable number of the fatal cases are defective as regards the treatment, the patients coming under observation at a late period of the disease, and pains not having been taken to note the measures which had previously been employed. In only about eighty cases are the histories sufficiently complete in this respect for analytical study. Another reason for this limited number of cases is, I have excluded those in which the fatal termination was due to some complication or intercurrent affection, such as pneumothorax, pleurisy with large effusion, lobar pneumonia, intestinal ulcerations, peritonitis, etc.

It is hardly to be expected that many cases of phthisis will end fatally without some important measures of treatment, either medicinal or hygienic, having been employed. Cases, however, are not extremely infrequent in which this is true for a considerable period after the date of the commencement of the disease. Including some cases to which the latter statement will apply, the first series will consist of sixteen cases. I shall give a succinct account of these sixteen cases, subjoining such remarks as the facts may suggest.

Case 1. This is the first case of phthisis in my records, having been noted in 1836. The patient was a fuller in a woollen mill. He had a continuous cough for from twelve to fourteen years. His habits were intemperate. He continued to do full work up to a year and a half, and light work up to a few weeks prior to his death. There is reason to believe that the treatment consisted of only palliative remedies. The lungs were found after death to contain large cavities, and miliary tubercles in abundance. The latter may have been developed shortly before death, so that this case, perhaps, was an example of a patient with phthisis becoming tuberculous, according to the language of Niemeyer.[1] It may be added that the patient lived in a valley on the bank of the stream which furnished the water-power of the mill in which he worked. The case might with propriety have been included among the cases of slowly progressing phthisis.

Case 2. Mrs. C., aged 35, was confined in July, 1838. There was no secretion of milk, and this had been the case after previous confinements. She had some cough during pregnancy. It continued and increased after confinement, but her condition was not considered grave enough to require medical treatment until the December following. She was then evidently in advanced phthisis, and died a month afterward. The treatment consisted of only palliative remedies. The duration in this case was seven or eight months. This was the case referred to in a preceding chapter, in which the patient at first received the information that she had pulmonary disease with indignation; but, toward the last, she accepted the fact with a spirit of exultation, sending for me on one occasion in order that I might witness how happy she would be in dying, and attempting to sing a hymn in the last moments of life.

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[1] With reference to the often quoted statement by Niemeyer, that the great danger to patients affected with phthisis is that they may become tuberculous, the remark attributed to Billroth is pertinent: "Dass es dem phthisiker doch wohl nicht schlimmer gehen könne, als dass er stürbe, und dies komme sehr oft ohne allgemeine tuberculose zu stande." Ueber locale tuberculose von Dr. C. Friedländer. Leipzig, 1873.

Case 3. Mr. N., aged 36, farmer, was seen by me June 1, 1846. No family predisposition to phthisis. He had failed, as regards his muscular strength, for two years; but he dated his cough from January, 1846 Hoarseness had existed since the latter date. He had kept about, and did not consider himself ill prior to January. He had no treatment except domestic palliatives. In June he had the physical and rational evidences of advanced phthisis, and died a month afterward. He insisted, at the time of my visit, that he had only a cold, and would be well were it not for general debility. His habits were temperate. He took no remedies excepting some medicines which he obtained from a botanic practitioner. The duration was at least six months.

Case 4. Mr. C., aged 25, clerk, formerly in country store and recently in a livery stable, was seen by me in August, 1858. No family predisposition to phthisis. Cough had existed since the spring of 1857, and during the summer he lost appetite, strength, and weight. He had, early in the summer, a slight hæmoptysis. He kept about, and had no medical advice. In the winter of 1857–58 he regained appetite, strength, and weight, and his cough was slight. In the spring of 1858 he was said to have whooping-cough, and he again declined in appetite, strength, and weight. He began to take cod-liver oil and balsam of fir, but discontinued these remedies in a short time, and took homœopathic preparations. At the time of my visit he was much emaciated, and evidently in advanced phthisis. He died soon afterward.

At the time when this case occurred, the so-called infinitesimal doses were employed by the homœopathists, and I have therefore considered that there was no medicinal treatment. The notable improvement in the winter of 1857–58 was without any treatment or change in habits of life. The patient took no alcoholics. The duration was about one year and eight months.

Case 5. Mr. C., aged 28, planter in Mississippi, consulted me in November, 1860. A brother had died with phthisis. Cough had existed since January, 1858. The expectoration until lately had been small, but it was now profuse. He was thirty pounds under his average weight in health. He had never had any medical advice, but had taken some domestic and popular remedies for cough. He had kept about, attending to his plantation, his habits active, living well, and taking a little spirit daily. The only variation from his usual habits of life was a trip to the mountainous part of Virginia in the summer of 1859. The physical signs showed phthisis advanced to cavities. Palliative remedies only were prescribed. Death took place shortly afterward. Duration about three years.

Case 6. Mr. H., aged 30, of Connecticut, consulted me in April, 1868. His father and mother, together with seven sisters, had died with phthisis, and he had neither sister nor brother living. The previous duration of cough is not noted. He was but little below his normal weight, and his aspect was not morbid. The physical signs showed much solidification of the upper and middle lobe of the right side. I suspected that this was in part due to an intercurrent pneumonia (croupous). Immediate change of climate and out-of-door life were advised. Alcoholics he had tried, and the immediate effect was not good. I subsequently learned that this patient was completely discouraged by the communication of the fact that he had pulmonary disease, and died in the following autumn, resigning himself to his fate, and resorting to no treatment.

Case 7. Mrs. E., aged about 30, of Pennsylvania, consulted me first in October, 1868. She had lost a sister with phthisis. Cough had existed for several years. During the preceding year she had lost considerable in weight. Her aspect was not morbid. The signs showed considerable solidification at the summit of the left lung, and some pleuritic effusion on that side. In November, 1868, cracked-metal resonance and cavernous respiration were noted, with diminution of the pleuritic effusion. In January, 1869, there was notable improvement in aspect and strength. The cough and expectoration, also, were less. The cavernous signs still existed. In May, 1869, noted that she had gained during the winter, but declined somewhat in the spring. Cavernous signs existed before. In October, 1870, her general health was fair, and her aspect not notably marked. The signs showed solidification and cavities at the summit of the left lung. She subsequently died, but the date of death is not noted.

The treatment, in this case, consisted of tonic remedies, with palliatives of cough, and the moderate use of alcoholics.

Case 8. Mr. Van D., lawyer, of New York City, aged 35, was examined by me in February, 1868. The signs then showed a considerable tuberculous affection at the summit of the left lung. The previous duration of the cough is not noted. He had been treated for some time by inhalations. He remained in the city during the spring months, taking a tonic remedy, alcoholics moderately, and cough palliatives. He improved progressively as regards strength and aspect. In the summer he went into the country, and discontinued altogether the use of alcoholics. On his return to the city in October, he presented nearly as healthy an appearance as when he was well. He had, however, an abundant expectoration, and was deficient in breath on exercise. The signs now showed shrinkage of the upper lobe of the left lung, and the existence of cavities. In my memoranda of the case, I noted "a striking example of notable improvement in the spring, here in New York, the tuberculous affection extensive and no special medication." Death took place not long after his return, but I did not see him afterward, and further details were not obtained.

Case 9. Mr. R., Professor of Chemistry, aged 27, consulted me in September, 1868. Cough had existed since the preceding August. The signs showed solidification within a circumscribed space on the anterior lower aspect of the right side of the chest. In October the solidification had diminished. He was five pounds under his standard in weight. The appetite and digestion were good. Only a cough palliative was prescribed. He continued at work in his laboratory until July, 1869. At this time he had only a slight cough, and the solidification had notably diminished. He then went into the country, and was engaged in teaching chemistry in a collegiate institute during the remainder of the summer and the following winter. During this time he considered himself well, but he was not free from cough. He began to decline in the spring of 1870, and he then presented well-marked cavernous signs. He lost weight and strength progressively, and early in the summer, of his own accord, he made a voyage to Europe, returning in August extremely feeble, and death taking place soon afterward. The treatment consisted of palliative remedies, excepting that at one time he took quinia freely for daily recurring paroxysm of fever.

Case 10. Margaret C., aged 18, married, was admitted into hospital in January, 1849. Cough had existed for a considerable period, the precise duration not noted. For two months there had been almost daily a paroxysm of fever with pronounced chill. She had kept the bed most of the time for the past three weeks. At the summit of the chest, on the right side, the signs denoted cavities. Death took place in the following March. Excepting quinia for the quotidian paroxysms, the treatment consisted of palliative remedies only.

Case 11. John McL., aged 26, laborer, was admitted into hospital Oct. 12th, 1852. Cough had existed since the preceding April. He had kept at work, although not able to do his full amount of labor, up to five weeks before his admission. His voice became hoarse in September, and was now extremely husky. The signs showed a large tuberculous affection of the summit of the chest on the left side. Death took place eight days after the date of his admission.

Case 12. Patrick P., aged 27, laborer, was admitted into hospital October 1st, 1852. Cough had existed for eighteen months. He had continued to work up to seven weeks before his admission. He gave up work on account of hæmoptysis, which had not occurred previously. The signs showed considerable solidification at the summit of the chest on the left side. After his admission, the hæmoptysis recurred and became profuse. It was arrested by the application of ice to the chest. Death took place ten days after his admission.

Case 13. Hugh McM., stonecutter, was admitted into hospital January 9, 1853. His parents were living and well. Cough began in February, 1852, and continued until April. From April until September, he was free from cough. He worked at his business in this interval, but he was rather weak. The cough returned in September and had persisted. The signs showed notable solidification at the summit of the lung on the right side. He had in the hospital persistent diarrhœa, and died four weeks after his admission.

Case 14. George D., aged 52, German laborer, was admitted into hospital in January, 1858. Cough had existed for ten years or longer. He had, however, kept steadily at hard work as a day laborer, until, three years prior to his admission, he had been compelled to take the lighter work of a gardener. He had quit work nine weeks, and taken to the bed five weeks, prior to his admission. The right side of the chest was contracted, and there was flatness on percussion above the third rib on this side, with bronchial respiration, bronchophony, and moist rales. Death occurred the day after admission. There was no autopsy. The signs rendered it probable that the affection was fibroid phthisis.

Case 15. Jesse B., aged 26, coppersmith, was admitted into hospital in November, 1853. Cough had existed since the preceding March. Hæmoptysis occurred at the commencement of cough. Four weeks afterward he took to the bed, and kept it for four months. During this time he had daily paroxysms of fever with chills and sweating. He took no remedies excepting blue pill and Epsom salts. The paroxysms at length ceased, and he worked at his business for four weeks, when he was obliged to quit it on account of debility and want of breath. The signs showed great solidification of the summit of the chest on the right side, with diminished motion and flattening. Death took place in February, 1854. While in hospital he took for a time cod-liver oil; aside from this, the treatment consisted of palliative remedies only.

Case 16. McL., recruit U. S. Army. At the time of his enlistment, November, 1837, he presented the appearance of good health. He had a cough which was supposed to denote a "cold." Two weeks after his enlistment, having been during this period much of the time beastly drunk, he applied for treatment complaining of diarrhœa. Balsam of copaiva, opium, and calomel were prescribed for this symptom. He failed rapidly, and died in about six weeks. The post-mortem examination showed tuberculous cavities in both lungs and solidification.

The duration in this case is indeterminate, but phthisis had existed doubtless for a considerable period prior to his enlistment, and at that time, the tolerance of the affection was such that it was not suspected. There is no reason to suppose that he had any treatment prior to his enlistment, and the subsequent treatment consisted of palliative remedies.

The reason for not resorting to treatment in some of these sixteen cases was the want of appreciation of the disease on the part of the patients. In other cases the patients, being dependent on their daily labor, probably avoided medical advice as long as possible under the belief that if they took remedies they must cease to work; and, in one case at least, treatment was declined from a conviction that it could be of no service.

The ages in the 16 cases varied between 18 and 52 years. The occupations in ten cases were as follows: Fuller, farmer, clerk, planter, lawyer, teacher of chemistry, and coppersmith—each represented by a single case, and three of the patients were day laborers. Thirteen of the patients were men, and three women. In two cases the patients were intemperate; nine were temperate, the habits in the remaining cases not having been noted.

The duration of the disease varied between twelve or fourteen years and six months. The case in which the duration was twelve or fourteen years, and another case in which it was ten years (the latter probably fibroid phthisis), might, with propriety, have been included in the group of cases of slowly progressing phthisis. Exclusive of the foregoing three cases, in eight cases, respectively, the duration was, 7 or 8 months, 18 months, 3 years, several years, 2 years, 7 months, 18 months, and 11 months, the duration in the remaining cases not being determinable.

In three of the cases, namely, Nos. 4, 8, and 9, the temporary improvement which took place, as regards the general and local symptoms, is worthy of note.

Of the cases ending in recovery (page 278), in eight there was no medicinal treatment of importance, nor any material change in the habits of life. This was true of the six cases in which the disease was arrested or non-progressive (page 284), and of one of the cases of slowly progressive phthisis (page 293). Adding to the 16 cases just given the foregoing 15 cases, and the total is 31 cases. In these 31 cases the disease was allowed to go on without any active interference in the way of either medicinal or hygienic treatment. The cases are, therefore, peculiarly interesting with reference to the study of the natural history of phthisis. In so far as we may be authorized to deduce from these cases conclusions, they are that, of 31 cases in which the disease is left to itself, 8, or nearly 26 per cent., will end in recovery; in 6, or a little over 19 per cent., the disease will become non-progressive for an indefinite period, and in a fraction over 51 per cent. the disease will end fatally after a duration ranging between six months and twelve or fourteen years. These conclusions would be immensely important, as the basis for estimating the influence of treatment on the disease, were it proper to accept them as representing correctly the relative proportion of cases in which this disease tends intrinsically either to recovery, to become non-progressive, or to end fatally. Were they to be thus accepted, they would tend to discourage efforts in the way of treatment. The cases, however, are too few to justify conclusions for a general application. The number is perhaps larger than any one observer has hitherto recorded and analyzed, and as a contribution to the study of the natural history of phthisis with reference to its intrinsic tendencies, they certainly have considerable value.

In the following twenty-two cases there was no medicinal treatment of importance, that is, it consisted either of simple tonic and palliative remedies, or, if remedies were given with reference to a special influence, they were not taken sufficiently to be of any account, but the treatment involved changes as regards out-of-door life, or of climate—in other words, hygienic measures.

Case 1. Mr. W., lawyer, aged 22, of Buffalo, N. Y., was seen by me in March, 1847. He had been ill for four or five weeks only. The signs denoted solidification anteriorly at the left, and posteriorly at the right, summit of the chest. He shortly expectorated a considerable quantity of puruloid matter, after which cavernous respiration existed at the left summit. In June, 1848, I noted that this patient having taken tonic remedies, and living as much as possible in the open air, soon began to improve. His pulmonary symptoms disappeared, and he became quite stout. In the winter of 1847–48, he went to Savannah, Georgia. While residing there he had a seizure considered to be apoplectic, for which he was bled copiously and placed on low diet. His cough returned. He came home and died soon after his arrival. The symptoms, after his return, denoted, unequivocally, phthisis.

Case 2. Mr. C., aged 21, of Buffalo, N. Y., with a family predisposition to phthisis, consulted me in August, 1851. Cough had existed since the preceding June, and he had had hæmoptysis twice. The physical signs showed considerable solidification at the summit of the chest on the left side. Under date of June, 1852, I noted that this patient shortly after consulting me married, and early in the autumn went to Florida. His health immediately improved. The cough almost entirely disappeared. He gained in weight and strength, and considered himself quite well. Soon after his return home, the cough increased. The date of his death is not noted.

Case 3. Miss H., aged about 20, of Owego, N. Y., was visited by me in August, 1852. The physical signs and symptoms then denoted a small affection. She shortly afterward married, went to Florida, and died in February, 1853.

Case 4. Mrs. P., aged 20, from Illinois, came under my care at Buffalo, N. Y., in June, 1857. She had had pleurisy with effusion in the preceding winter, and cough had since continued. The signs showed considerable solidification at the summit of the left lung, with contraction of this side from the pleurisy. The stomach did not tolerate the cod-liver oil. She took alcoholics moderately and tonic remedies. She was kept in the open air much of the time. In July there seemed to be some improvement; but in August her appetite failed, diarrhœa became a prominent symptom, and death occurred in this month. She continued to go out of doors until within a few days before her death.

Case 5. Mr. G., lawyer, in Buffalo, N. Y., aged about 25, in 1851 had cough and considerable expectoration, persisting for several months, with loss in weight, and night sweating. He left his business, was much in the open air for several weeks, and recovered apparently his health in all respects. In the winter of 1856–57, his cough returned, and he went to Aiken, S. C., where he passed several months, living in the open air, and returning home he travelled much of the way on horseback. As regards his general health, he seemed well, and he became stouter than he had ever been. His cough, however, did not entirely cease. He had no medicinal treatment excepting some palliative remedies. He was not under my observation until December, 1857, when he had pleurisy with effusion. He recovered from the pleurisy, but his cough continued and he gradually declined, the date of his death not having been noted.

Case 6. Mr. H., medical student, aged about 20, in Buffalo, N. Y., had cough with physical signs denoting phthisis in the spring of 1857. He travelled in the Western States, returning free from cough and apparently well. He attended medical lectures, at Buffalo, in the winter of 1857–58. In the latter part of the winter his cough returned, and his general health declined. During the winter he resorted to active exercise on horseback, taking only palliative remedies. In February he kept the house much of the time. There was now considerable and extensive solidification of the lower lobe of left lung. This persisted in March, after which I did not examine the chest in consequence of his reluctance to know the condition of the lungs. He improved, and had fair health during the summer, taking much active out-of-door exercise. In the autumn he went to Augusta, Ga., and died in February, 1859.

Case 7. Miss Nelly B., aged 18, residing in New York City, came under my care in May, 1861. Cough had existed for two years. The winter of 1859–60 had been spent in Cuba, New Orleans, and other places in the South; the summer of 1860 in Minnesota, and the winter of 1860–61 at Lexington, Ky. She now presented a healthy appearance, and was not much below her average weight of health. She had had no medicinal treatment excepting remedies for cough. She had taken for a year alcoholics moderately, but they had been lately discontinued. The physical signs showed a considerable affection at the summit of the left lung. She passed the summer of 1861 partly in New York, and partly in the neighborhood, taking whiskey very moderately, and palliatives for cough. She held her own until winter, when she began to decline. In January she went to Cleveland, her native place, progressively declined, and died in the following summer.

Case 8. Willie B., aged 17, brother of No. 7, had slight cough and hæmoptysis in June, 1861. The physical signs, at that time, showed a tuberculous affection at the summit of the right lung. His general health was apparently good, excepting that he seemed to be delicate. He took a sea voyage to Portland, Maine, and afterward went into the country in the neighborhood of New York. He returned to the city in the autumn much improved in appearance and strength. The cough was now slight. He took alcoholics in small quantity. There was no medicinal treatment. In February, 1862, he had lost ground, and the physical signs showed an increase of the disease. He made a journey to Cleveland and back during this month. In the following summer he went to St. Paul, Minnesota, and seemed to improve somewhat. He returned to Cleveland in the autumn, and died in January, 1863.

Case 9. Henry B., aged 16, brother of Nos. 7 and 8, was examined by me first in June, 1861. A dry cough had existed for several weeks. Otherwise he seemed to be well. He was at school preparing for college. The physical signs showed a small affection at the summit of the left lung. He was removed at once from school, and was much of the time in the open air. In August the cough ceased, and he seemed to be perfectly well. He remained well and was apparently robust in the December following. He was now at a military school in Peekskill, N. Y. In January, 1862, he continued free from cough and apparently well. In February, 1863, he was transferred to a school in Middletown, Connecticut, and during this month his cough returned. The physical signs now showed an increase of the affection. He went to Europe at once, travelling during the summer, and spending most of the following winter in Nice. In his absence he became dissipated in his habits. He returned, however, quite well, in the summer of 1864. From this time to the summer of 1866, he travelled, going to South America and France in sailing vessels. In the summer of 1866 he had cough, and his aspect wás delicate; but I made no examination of the chest. In the autumn of this year he went to St. Paul, Minnesota, and passed the winter there. He declined during the winter, and died in the following spring. He had at no time any medicinal treatment of importance.

Case 10. Mrs. S., aged 35, consulted me in November, 1861. Cough had existed for two years. The physical signs showed a large affection, with cavities, at the summit of the right lung. She resided in the country, on the Hudson River. She had taken very little medicine, and had been much of the time out of doors. During the summer she had travelled in Minnesota, and to Lake Superior. She had taken alcoholics moderately. I quote from my record the following: "Here is a case in which the tuberculous affection is large, and has existed probably for two years; and the patient has been, and is still, in a tolerable condition as regards her general health. It is interesting to note, in connection with this, the course of management which she has pursued under the guidance chiefly of her own good sense and the suggestions of intelligent friends." I advised continuance in the same course. In March, 1862, she wrote me that her condition was improved. The date of her death is not noted.

Case 11. W. J. S., aged 56, merchant, residing in New York City, consulted me in May, 1867. His father died of phthisis. Several years previous to the above date, he had repeatedly hæmoptysis. He had at the same time cough, and his general health was bad. He went to New Orleans and recovered. He had now a dry cough which had existed for some months, and hæmoptysis had recently occurred. Perineal fistula had existed for several years. His aspect was healthy, and he was but little under his standard weight. The physical signs showed a moderate affection at the summit of the right lung. I noted in June, 1867, that he had sailed for Europe. He returned in the September following. His general aspect was improved, but his cough was troublesome. He stated that he lost his cough during the voyages. In September, 1869, the physical signs showed no increase of the affection. His voice was now husky, and had been so for some time. He had passed the summer in the Adirondacks. Shortly after this date he went to California, and died there in March, 1870.

Case 12. J. D. E., aged 46, merchant in New York City, consulted me in September, 1863. In the preceding May he had slight hæmoptysis, and it had recurred repeatedly since that date. He had now slight cough and expectoration. He was very little under his standard weight, and his aspect was not morbid. The physical signs showed a moderate affection at the summit of the right lung. In April, 1864, I noted that he had just returned from Minnesota, where he had passed the winter, living in a tavern on the prairies, and having been much of the time out of doors. He reported improvement, and his aspect was healthy. He had not lost in weight. The physical signs showed no increase of his disease. He now removed to Orange, New Jersey, coming into town daily to attend to his business. In July, 1864, he had lost fifteen pounds in weight, and his strength had declined. He had taken no remedies, and had discontinued stimulants, which he had previously taken moderately. The physical signs now showed increase of solidification and cavities. In October, 1864, noted that I did not see him again, and that in the mean time death had taken place.

Case 13. Mr. S., merchant, residing in Brooklyn, New York, aged 26, consulted me in January, 1864. He had recently married. Slight hæmoptysis had occurred two years before this date. Cough had existed for a year. He had lost eleven pounds in weight. Of late diarrhœa had existed. The preceding summer he made a voyage to Liverpool, in a sailing vessel, with benefit. The physical signs showed a considerable affection at the summit of the right lung. In June, 1864, I noted that he went to the West Indies, without benefit, the diarrhœa continuing, and that he had recently died.

Case 14. Miss W., aged 18, residing in New York City, came under my care in March, 1864. Her father died with phthisis. Cough had existed for several weeks; the menses had been suspended for several months, and recently hæmoptysis had occurred. Her aspect was healthy, and she had a remarkably brilliant complexion. The physical signs showed a moderate affection at the summit of the right lung. A tonic remedy was prescribed, and she shortly went to Cuba, returning in the latter part of the May following. During her stay in Cuba she declined in strength, her appetite diminished, and she had diarrhœa; the physical signs, however, showed no increase of the pulmonary affection. Alcoholics affected her unpleasantly, and they were not, therefore, advised. She improved after her return from Cuba, and in July, 1864, went to New Hampshire, where, finding that her cough increased, her appetite diminished, and that she had night sweating, she returned, after a few days, to New York. She remained in New York during the summer and the following winter. The cough became slight, and her general health was excellent. This is the case already referred to (page 180) in which the complexion at this time was so florid that she was annoyed in walking out by the remarks of persons meeting her. In the spring she began to decline, and she then became the patient of a homœopathic practitioner. Death took place during the summer.

Case 15. T. C. W., aged 42, lawyer, residing in Buffalo, N. Y., consulted me in April, 1864. Cough and expectoration had existed for several months, and he had had repeatedly hæmoptysis. The physical signs showed a moderate affection at the summit of the left lung. He shortly sailed for Liverpool, and died there in the following June or July. He suffered very much from sea-sickness, taking very little food during the passage. His strength was not greatly reduced, and his aspect was not notably morbid at the time of his consulting me.

Case 16. Mr. C., aged 35, farmer, consulted me in August, 1864. Hæmoptysis, which was neither preceded nor followed by cough, had occurred five or six years prior to this date. He was then engaged in business in New York City. He at once went into the country, became a farmer, and had had good health until within five or six weeks, during which time there had been cough and slight expectoration. There was not much loss in weight and strength. The physical signs showed some solidification over the lower lobe of the left lung, together with obstruction of the left primary bronchus. In the September following, the same physical signs were found. He took tonic remedies, alcoholics moderately, and was much in the open air. He improved in weight and strength up to March, 1865. The physical signs remained at that time about the same as previously. In August he had held his own as regards weight and strength, the physical signs remaining the same. In February, 1866, there was still obstruction of the left primary bronchus, but the solidification of the lower lobe of the left lung had notably diminished. His general condition was better than heretofore. The cough and expectoration were slight. He had lived on his farm, taking alcoholics moderately, and no medicine. In June, 1866, the general condition and the physical signs remained the same. In February, 1867, there was no material change. He went to New Orleans in March, and returned improved. In June he had an attack of sporadic cholera, after which he failed in strength and lost in weight. In the latter part of July he was pallid and feeble, his appetite was poor, and he had diarrhœa. The physical signs now gave evidence of cavity at the summit of the left lung. He went shortly after this date to Minnesota, and died not long afterward, the date of his death not having been noted.

Case 17. Mr. D., aged 34, secretary of an insurance company, residing in New York City, consulted me in October, 1864. Three years prior to this date he had had a series of attacks of hæmoptysis, occurring at night, neither preceded nor followed by cough. After this he had had good health, but within a few months there had been cough and diarrhœa. He was fifteen pounds under his weight of health. His voice was husky. The physical signs showed a moderate affection at the summit of the left lung. He had taken no remedies except for diarrhœa. Shortly afterward he went to Europe, and died during the winter, the date of death and other details not having been noted.

Case 18. Mr. R., aged 34, consulted me in January, 1866. His mother, a brother, and a sister had died with phthisis. Slight cough had existed for a year. He was nearly up to his standard weight of health. The physical signs showed a small affection at the summit of the right lung. He had hardly considered himself ill. He made a voyage shortly afterward to Rio Janeiro, returning in May with much increase of his disease, and death took place soon after his return.

Case 18. Mr. S., aged 41, superintendent of a mercantile college, was examined by me in November, 1866. At that time phthisis existed, but the signs were not noted. He went to Nassau, N. P., and remained there three months without appreciable benefit. I examined him again in July, 1866. He now had advanced tuberculous disease at the summit of the right lung, the signs showing cavities. The treatment consisted of tonic remedies and out-of-door life. Death took place in the following winter, the date and other details not having been noted.

Case 19. Mrs. McE., aged 32, consulted me in November, 1866. Cough and expectoration had existed for from two to three years. The treatment had been alcoholics moderately, the free use of cream, and out-of-door life. The aspect was now not morbid. She had gained during the past summer in weight eighteen pounds, and was not now much under her standard weight of health. The physical signs showed a moderate affection at the summit of the right lung. In October, 1868, I noted that she had passed the winter of 1866–67 in Mentone; the summer following in the highlands on the Hudson; the winter of 1867–68 in Aiken, South Carolina; and the summer of 1868 in Suffern, New Jersey. Her aspect was not morbid, but the physical signs showed considerable and advanced disease at the summit of the right lung. The treatment had consisted of palliatives, the moderate use of alcoholics, and, of late, a preparation of naphtha. Death took place in November, 1869, further details not having been noted.

Case 20. Miss P., aged about 22, residing in Armenia, N. Y., was visited by me in March, 1867. Cough and expectoration had existed for some time—the precise duration not noted. She now kept her room, and was quite feeble. The appetite was poor. The physical signs showed considerable solidification of the upper part of the left lung. She was advised to go out of doors daily as much as her strength would permit, and tonics were prescribed with the moderate use of alcoholics. In October, 1867, she visited me in New York. Her general condition was much improved. The aspect was not morbid. The appetite and digestion were good. The physical signs showed still a considerable affection of the upper part of the left lung. A voyage to Europe or to the West Indies was advised. She did not, however, leave home, and afterward died, the date of death and other details not having been noted.

Case 21. Mr. C., aged about 30, consulted me in September, 1868. Cough had existed for four years. He had had repeated attacks of hæmoptysis. He was twenty pounds under his weight of health. The physical signs showed a considerable affection of the summit of the right lung. During the preceding four years he had travelled pretty constantly, in Europe, in California after a voyage around Cape Horn, and in the Southern States. He was in good spirits, and had much energy. He shortly afterward crossed the Atlantic, and died in Rome.

Case 22. Mr. R., aged 33, merchant, residing in Boston, Mass., consulted me in October, 1870. In 1869 he had had pleurisy with effusion, after which he became stout, and remained well until the latter part of the summer of 1870, when cough began. He was now much emaciated and feeble. His appetite was poor. He had considerable expectoration. The physical signs showed a considerable affection at the summit of the right lung. In November he had much improved, having remained in New York, taken some tonic remedies, with alcoholics moderately, and been much in the open air. The physical signs remained the same. In December the general improvement had been progressive. He sailed in this month for the East Indies. He returned to New York in July, 1871, having been around the world. He lost his cough, and began to improve soon after his voyage commenced, and he remained free from cough, as he stated, until he took cold in California. He was now up to his best weight in health, and his aspect denoted robust health.

The physical signs showed solidification and cavities at the summit of the right lung. He went to the far West to reside, and died in the following winter from some intercurrent affection, the details not having been noted.

In the foregoing 23[1] cases, the ages varied between 15 and 56 years. Sixteen were men, and 7 were women. All the cases were in private practice. Of eleven cases, in which the occupations were noted, 3 were lawyers, 4 were merchants, 2 were students, 1 was a farmer, and 1 was the secretary of an insurance company.

The duration of the disease, in the cases in which this is determinable from the histories, varied between nearly 5 years and 3 months. In one case it was 4 years and 6 months; in one case 4 years and 4 months; in one case 3 years and 6 months; in one case 3 years, and in one case 2 years. The mean duration in 14 cases in which it was determinable either with exactness or approximately thereto, is a fraction over 27 months.

With a view to the inquiry, how far the hygienic treatment in these 14 cases contributed to prolong the disease, these cases may be compared, as regards the duration, with the cases in which there was neither medicinal nor hygienic treatment. Of the latter cases the duration was determinable in ten. In 2 of these 10 cases the duration was very great, namely, 12 or 14 years and 10 years. These two cases should have been included in the group of cases of slowly progressing phthisis. Including these two cases (in one of which the disease was probably fibroid phthisis) the mean duration is a fraction over 39 months. This result would go to show that hygienic measures did not tend to prolong the duration of phthisis. The comparison is more fairly made after excluding these two cases. Doing this, the mean duration in the eight remaining cases is a fraction under 16 months. This result shows the duration to have been not far from twice as great in cases having hygienic treatment, as in cases receiving neither hygienic nor medicinal treatment. Of the latter cases, excluding the two in which the duration was 12 to 14 and 10 years, the maximum duration was three years and the minimum seven months. A comparison such as has just been made, would afford conclusive evidence as regards the influence of hygienic measures on the duration, were the number of cases compared sufficiently large. Here the number of cases is small, namely, 14 and 8; but so far as the comparison of these cases warrants any conclusion, it is, that in fatal cases of phthisis the disease is prolonged by hygienic measures of treatment.

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[1] In the enumeration of these cases, an error inadvertently occurred, two of the cases being numbered 18. The error was noticed too late for correction, but the subsequent calculations have been made with a correct enumeration.

A comparison of the two groups of cases in another point of view, affords striking evidence of the favorable influence of hygienic treatment, that is, a comparison with reference to the notable improvement and tolerance of the disease after the employment of the hygienic measures—living in the open air, sea voyages, and change of climate. Of the foregoing 23 cases, in 11 notable improvement appeared to be an effect of one or more of these hygienic measures. These 11 cases are Nos. 1, 2, 5, 6, 7, 9, 10, 12, 14, 20, and 22. In four cases the tolerance was remarkable, and was apparently dependent, more or less, on the hygienic measures, namely, Nos. 10, 16, 19, 21.

It remains to analyze all the cases in my collection in which the treatment consisted either entirely or mainly of hygienic measures, with reference to the relative proportion of, 1st, the cases ending in recovery; 2d, the cases in which the disease became non-progressive; 3d, the cases in which the disease was slowly progressive; and 4th, the cases ending fatally. Of the cases ending in recovery, 15 were treated exclusively or mainly with hygienic measures; of the cases in which the disease was arrested or non-progressive, 10, and of the cases of slowly progressing phthisis, 7 were in this category. Adding these 32 cases to the 23 cases ending fatally, and the whole number is 55.

Of these 55 cases, thus, 15, or a fraction over 27 per cent., ended in recovery; in 10, or a fraction over 18 per cent., the disease was arrested or non-progressive; in 7, or a fraction under 13 per cent., the disease was very slowly progressive, and 23, or a fraction under 41 per cent., were among the fatal cases.

Now, comparing these results with those of a similar analysis of 31 cases in which there was neither medicinal nor hygienic treatment (*vide* page 301), the proportion of recoveries exceeds that in the latter by a fraction under 2 per cent.; and the proportion of deaths is less by about the same proportion. The proportion of cases in which the disease was arrested or non progressive is less by about 1 per cent.

This difference in favor of hygienic, over no treatment, in cases of phthisis, of less than 2 per cent., as regards recoveries and deaths, is to me a surprise, and, I will add, a disappointment. It is to be borne in mind that the number of cases is not large. I give the results of the analysis and comparison without further comment, excepting this remark, namely, in so far as either medicinal or hygienic treatment, or both combined, may be shown to have but little influence over the termination of the disease, the agency of what I have termed an intrinsic tendency to either recovery or to death, is enhanced. It is to be considered that these figures show some influence of hygienic measures on the termination of phthisis, although much less than was to have been expected; and it is also to be considered that the apparent influence on the duration is more marked than on the termination. I will add further, in a disease like phthisis it is important, and it is the duty of the physician to bring to bear upon it any agency, medicinal or hygienic, which experience shows to have a favorable influence, however small.

I come next to the study of those of the fatal cases in which medicinal treatment was employed with a view to influence favorably the course and termination of the disease. The chief point of inquiry in this study relates to the usefulness of the cod-liver oil. I shall give, first, a succinct account of the cases into the treatment of which this remedy entered.

Case 1. Mrs. B., aged 39, consulted me in October, 1849. A slight cough had existed for several months, but it had been considered of consequence only for the past six weeks. The physical signs showed a considerable affection at the summit of the right lung. In December, 1849, her husband reported that she went to New Hampshire shortly after seeing me, and was there still. He stated that she had much improved, and that her pulse, which at the time of my examination was 120, had fallen to 80 per minute. She had taken cod-liver oil, and no other remedy excepting a cough palliative. I noted subsequently that she had died, but not the date of death, nor any other details.

Case 2. Mrs. W., aged about 20, residing in Buffalo, N. Y., was under my care in June, 1850. Cough had existed since April. She was now emaciated and feeble. Paroxysms of fever with pronounced chills recurred daily with much regularity. The physical signs showed a considerable affection at the summit of the left lung. The paroxysms of fever were promptly arrested by quinia. The winter of 1850–51 she passed in Virginia, her native State, and she was much of the time out of doors. She gained in weight and strength during this winter. She took constantly the cod-liver oil. The summer of 1851 was passed in Dunkirk, N. Y., and the following winter in Washington, D. C. Death took place early in June, 1853.

Case 3. Geo. B. W., aged 37, merchant, residing in Buffalo, N. Y., was under my care in September, 1851. Cough had existed for three weeks. The physical signs showed a small affection at the summit of the right lung. He began at once to take the cod-liver oil, together with a tonic remedy and a palliative for cough. In November I noted that his condition was improved, and that the physical signs showed no increase of the pulmonary affection. He passed the winter in Jacksonville and St. Augustine, Florida, progressively improving, his weight becoming greater than at any previous period of his life. In April he went to Savannah, where he thought he "took cold." He was treated there by purgative remedies, and confined to a farinaceous diet. Under this treatment he lost weight and strength so rapidly that he hastened home. He improved after his return, and appeared to hold his own during the next winter, spring, and summer, up to August, taking steadily the cod-liver oil. In August he was seized with choleraic dysentery, and died five days afterward.

Case 4. Mrs. D., aged about 35, residing in Buffalo, N. Y., came under my care in March, 1852. Cough, which had followed confinement, had existed about five months. The physical signs showed a considerable affection at the summit of the right lung. She began at this time to take the cod-liver oil. In January, 1853, I noted that she had held her own up to October. She had been out of doors as much as her strength permitted. During the summer of 1853 she had epidemic cholera, which was prevalent, and recovered promptly under treatment with full doses of morphine. Death took place in the winter of 1853–54, the precise date and other details not having been noted.

Case 5. Mr. H., aged 27, clerk in a fruit and game store, residing in Buffalo, N. Y., came under my care in April, 1852. Cough had existed since January, 1851. He had lost considerably in weight, and since January, 1852, he had night sweating. He was placed on the cod-liver oil, with gallic acid and a cough palliative. In January, 1853, I noted that he had improved rapidly during the preceding summer. After a time (it is not noted with more precision) he suspended the remedies, living generously, and, as much as possible, out of doors. His aspect greatly improved; the sweating at night ceased, and his pulmonary symptoms did not increase. In September, 1853, he went to Wheeling, Va. Death took place in October, 1854. Further details were not noted.

Case 6. J. P. McA., aged 26, merchant, residing in Canada, consulted me in the latter part of July, 1853. Cough had existed for about four weeks, and he had had hæmoptysis. The physical signs showed a considerable affection at the summit of the right lung. He was placed on the cod-liver oil, with a cough palliative, and out-of-door life was enjoined. In the latter part of August, 1853, the disease was found to have progressed; the breathing was hurried; he was emaciated and pale, and he had diarrhœa. The fact of his subsequent death is noted, with no date, nor other details.

Case 7. Dr. C. A. B., aged 28, residing in Buffalo, N. Y., had profuse hæmoptysis in the spring of 1855, preceded by dry cough and impaired general health. He went to Liverpool and London, and in the latter place had another profuse hemorrhage. After two or three months he returned, acting in the capacity of surgeon to an emigrant ship. He seemed quite well on his return, but he was not free from cough. He passed the winter of 1855–56, and the summer of 1856, at St. Katherine's, Canada. In the winter of 1856–57 he performed the duties of demonstrator of anatomy in Buffalo and in Toronto, Canada. He was never free from cough, and during this winter he declined in his general health. In April, 1857, he had pneumonia affecting the lower lobe of the left lung, from which he recovered slowly. In July, 1857, his aspect was not morbid, and he had fair general health. The physical signs at this time showed a considerable affection at the summit of the left lung. In the summer of 1858 he married, and engaged in a pretty active medical practice at St. Katherine, Canada. I noted in June, 1859, that he had cough and expectoration, and that his aspect was not as good as in February, 1858. I noted, also, that he had been accustomed to take cod-liver oil from time to time, and always found distinct improvement while taking it. He took alcoholics moderately. Death took place in November, 1859.

Case 8. A. B. W., aged 32, residing in Buffalo, N. Y., clerk, with tuberculous antecedents, consulted me in March, 1858. Cough had existed since January, 1858, and he had recently had hæmoptysis. The physical signs showed a moderate affection of the summit of the right lung. In March, 1859, I noted that he passed the preceding summer in Michigan, returning in the autumn improved in his aspect, and that he had passed the winter in Buffalo, engaging in a business which involved out-of-door life. He had also taken gymnastic exercises. He had held his own since the autumn. He had taken steadily the cod-liver oil, and alcoholics moderately. Shortly after this date he removed to New Hampshire, and subsequently died, the date of death, and other details, not having been noted.

Case 9. Mr. U., aged 27, was examined by me in April, 1858. He had had hæmoptysis in June, 1857, when he was apparently in perfect health, and cough had existed since that time. He had taken steadily the cod-liver oil, and alcoholics moderately. The physical signs showed a considerable affection at the summit of the left lung. His aspect was not morbid, and his general condition was fair. He had no occupation, and was much out of doors. He married in the summer of 1859. Death took place in the spring of 1860, further details not having been noted.

Case 10. Mrs. J., aged 47, residing in Buffalo, N. Y., was examined by me in June, 1860. Cough had existed for about four months. She was not much under her standard weight, and her aspect was not morbid. The physical signs showed a considerable affection at the summit of the left lung. In August, 1860, I noted that her condition was improved. She had been in the country, and taken cod-liver oil, with a tonic remedy, and alcoholics moderately. During the winter she was not under my observation. She declined in health, and in the spring of 1861 went to Minnesota, remaining there until the month of July. I received, shortly after her return, an account of her condition and of the apparent influence of the climate of Minnesota, in a letter from her husband, an eminent clergyman, from which I will make some extracts. At the time of leaving Buffalo, February 26th, "she was so feeble as to make it a matter of grave doubt whether such a journey ought to be attempted. I felt much disposed to urge the propriety of abandoning it; but my wife's heart was set upon going forward, and I yielded to her desire." . . . "The first day's journey to Cleveland was accomplished with less fatigue than I had anticipated, and, on our arrival at Cleveland, the patient for the first time in several months had a good appetite." They journeyed next to Chicago, and thence to a place one hundred and fifty miles north of that city. Here she was detained by prostration, and for several days was very ill. She was unable to travel further for several weeks, and during this time "the cough was severe and the expectoration enormous." She also had profuse night sweating. They reached St. Paul on the 25th of April, and after a few days went to St. Anthony. Quoting from the letter: "For two weeks after our arrival there, I could not perceive any improvement in my wife's symptoms. On the contrary, I think her cough was more troublesome than it had been. But after that there was a gradual improvement, until, probably at the end of six weeks, the cough had almost ceased, and she had gained much strength. The weather was very boisterous most of the time, the winds being as high as we have at Buffalo. Nevertheless, the atmosphere was perfectly dry, and my wife persevered in riding out, and derived much benefit from exposure to the open air." . . . "While there was an evident improvement, as indicated above, she was now attacked with symptoms of a different nature from any which she had previously experienced. As the lungs were relieved, the disease attacked the stomach, and every particle of food gave her much distress. This is the chief difficulty at the present time (July 31), together with an occasional disturbance of the bowels, which in several instances has reached the stage of a severe diarrhœa, and in one instance resulted in an attack of cholera morbus. The cough has returned since we left Minnesota, but it is by no means as troublesome as formerly, and the expectoration is comparatively small." . . . "If it were possible for me to leave my parish, I would go and settle in Minnesota."

This patient passed the winter of 1861–62 in Minnesota, and I was informed by the late Dr. Duval, that she was at the hotel in which he lived, and seemed to be in fair health. I saw her for a few moments in January, 1863. She was then at Buffalo. She seemed feeble, but was able to be up and about. The date of her death, and further details, are not noted.

The apparently potential influence of the climate of Minnesota in this case renders it highly interesting. Undoubtedly the confident expectation of benefit, and the consequent inducement to be as much as possible out of doors, had more or less to do with the improvement which took place during the first sojourn of a few weeks.

Case 11. Dr. D., aged 38, residing in Brooklyn, N. Y., was examined by me in September, 1860. Cough had existed since the preceding July. He had had a year previously chronic pleurisy with effusion. Hæmoptysis occurred in July, and had recurred repeatedly. He had continued steadily in practice. He had recently began to take the cod-liver oil. The physical signs showed a considerable phthisical affection of the summit of the right lung. In May, 1861, I noted that he continued in active practice, reporting in fair health, and having had several attacks of hæmoptysis during the winter. In November, 1861, I noted that hæmoptysis had continued to recur, and was sometimes profuse. He still continued in practice, and his general health remained fair. The physical signs showed an increase of the pulmonary affection. Shortly after this date, he removed to St. Paul, Minnesota. In March, 1862, he called upon me. His aspect was much improved. He had gained a little in weight. He returned to St. Paul, and decided to remain there permanently. The date of his death and further details are not noted. The history is defective as regards the continued use of the cod-liver oil.

Case 12. Mr. W., residing in Brooklyn, age 17, consulted me in October, 1860. Cough had existed since the preceding spring. A profuse hæmoptysis had occurred during the previous summer. His aspect was not morbid. He was ten pounds under his standard weight. The physical signs showed a moderate affection at the summit of the right lung. Cod-liver oil was prescribed, and alcoholics moderately. In May, 1861, I noted that he went shortly after my examination to Minnesota, that he was still there, and that, according to reports received from him, he was in good health. In February, 1862, I noted that he had returned to Minnesota, and had died. He improved after going to Minnesota, and was apparently well when, as was stated, he "took cold" and failed rapidly. The history is defective as regards the length of time during which the cod-liver oil was taken.

Case 13. Mrs. M., aged 32, residing in New York City, consulted me in February, 1863. Cough had existed since the summer of 1861. Her aspect was not morbid. I had been in the habit of meeting her frequently for a year or more, and had not suspected that she had any pulmonary disease prior to her consulting me. The physical signs showed a moderate affection at the summit of the right lung. She had taken steadily the cod-liver oil for several months, and alcoholics moderately. She consulted me especially with reference to going to Cuba for the spring months. She went to Cuba, as she had intended. I did not see her afterward. Death took place in the spring of 1864.

Case 14. Mr. C., aged 35, merchant, residing in Brooklyn, N. Y., was examined by me in June, 1863. Cough had existed since the preceding April. He was fourteen pounds under his weight of health. His aspect was morbid, and he had night sweating. The physical signs showed a considerable affection at the summit of the right lung. Cod-liver oil was prescribed, alcoholics moderately, and out-of-door life. In November, 1863, I noted that he passed several weeks in the country, and at once began to improve. He went afterward to Minnesota, and was absent eight weeks, the improvement being progressive. He was now nine pounds above his normal standard in weight, and his aspect was healthy. He reported that he felt in better health than before the development of his pulmonary disease when he had considered himself well. He had, however, slight cough and expectoration. He had taken the cod-liver oil steadily with cream, and alcoholics moderately. In July, 1864, I met this patient casually, and he appeared to be in good health. He began to decline in the spring of 1865, and died during the summer.

Case 15. Mrs. C., aged 30, residing in Dunkirk, N. Y., consulted me in October, 1863. Cough had existed for six months.

Her general health was good; she hardly considered herself an invalid. The physical signs showed a moderate affection at the summit of the right lung. She was at this time taking the cod-liver oil, and alcoholics moderately. In the November following, after a sudden and copious expectoration of purulent matter, cavernous signs were obtained. She went to Cuba shortly afterward, passed the winter there; returned to Dunkirk in the spring, and died soon after reaching home.

Case 16. Dr. B., residing in Massachusetts, aged 27, consulted me in October, 1863. Cough had existed for a year or more. He had passed the last winter in Minnesota, with benefit, and had improved since his return. He had gained in weight, and was able to take much active exercise. The physical signs showed a considerable affection at the summit of the right lung. In July, 1864, an examination of the chest gave no evidence of progress of the disease. He had meanwhile remained in Massachusetts, and taken much horseback exercise. He had taken all along cod-liver oil, and alcoholics moderately. Death took place in the summer of 1865, further details not having been noted.

Case 17. Mrs. A., aged about 25, residing in Massachusetts, consulted me in August, 1867. The previous duration of cough was not noted. Her aspect was not morbid. The physical signs showed solidification of the lower lobe of the left lung. She took cod-liver oil, with chalybeate tonics, and lived much in the open air. In the September following, the solidification had diminished, being now slight, and there was general improvement. She had fair health afterward, and in October, 1868, was confined with a healthy child weighing fifteen pounds. She had, however, never been entirely free from cough, and she failed rapidly in health after her confinement. In January, 1869, the physical signs showed an extension of the affection to the upper lobe of the left lung. She was then on her way to Philadelphia. Death took place in the spring following, further details not having been noted.

Case 18. Mary B. A., aged about 20, residing in Connecticut, consulted me in July, 1868. Cough had existed for several months. Her aspect was not morbid. The physical signs showed a small affection at the summit of the left lung. In the December following she had much improved. She had taken the cod-liver oil, with alcoholics moderately, and been much out of doors in the country. The physical signs showed no increase of the pulmonary affection. She was on her way to South Carolina. In January, 1870, I noted that she returned to Connecticut from South Carolina in the spring apparently in good health; but her health failed after her return, and she died during the summer.

Case 19. Mary C., aged 23, residing in the neighborhood of New York City, consulted me in November, 1868. Cough had existed for a year. Her aspect was not morbid, and she was only two pounds under her standard weight in health. The physical signs showed a small affection at the summit of the left lung. She had taken cod-liver oil for the past month. In January, 1869, she had improved in appearance and strength, having gained also in weight. She had continued the oil. In March, 1869, the cough was slight, and she reported otherwise well. In this month she went to Savannah. In May following I was informed by letter that she was doing well in Savannah. In October, 1870, I noted that a relative of the patient had informed me of her return from Savannah, and that, since her return, she had been under the care of a homœopathist, who had assured her that she had no pulmonary disease. For a year she had had diarrhœa. She was now emaciated and feeble, and was about to go to St. Paul, Minnesota. The date of her death and other details are not noted.

Case 20. Sarah M., aged 21, seamstress, was admitted into hospital of Buffalo, N. Y., in March, 1850. Cough had existed for two months. She had kept at work until ten days before her admission. She had lost considerably in weight, and now kept the bed most of the time. The voice was somewhat hoarse. The physical signs showed a considerable affection at the summit of both lungs. Cod-liver oil was prescribed. Death took place on the 29th of March.

I introduce this case because it is one in which cod-liver oil was given; but it evidently should not enter into any statistical investigation of the merits of the remedy.

Case 21. Thomas F., aged 16, was admitted into hospital in February, 1851. Cough had existed for four months. He was not greatly emaciated. He had profuse night sweating. The physical signs showed a considerable affection at the summit of the left lung. Cod-liver oil was given. Death took place April 1, 1851.

Case 22. Louis L., waiter, aged 20, was admitted into hospital on December, 1855. Slight cough had existed during the present winter and the past summer. The physical signs and symptoms were not noted at the time of his admission. In April, 1856, it is noted that he had improved under the use of cod-liver oil. The cough was now slight, and his aspect not morbid. The physical signs showed a considerable affection at the summit of the left lung, with cavities. In June, 1856, he left the hospital, and undertook to do light work. He was re-admitted in October, 1856. He had at this time quotidian paroxysms of fever, with well-marked chill. These were arrested by quinia. The cavernous signs at the summit of the left lung were marked. His voice became hoarse after his readmission, and at length extinguished. Death took place April, 1857.

Case 23. James F., aged 20, laborer, was admitted into hospital in January, 1853. Cough had existed for three months, but he had given up work only five days before his admission. His aspect was not morbid. He complained of want of breath on exercise. The physical signs showed a considerable affection at the summit of the left lung. He was placed on the cod-liver oil, and alcoholics moderately. In May, 1858, I noted that there was marked improvement as regards his general condition and the pulmonary symptoms. In July I noted that he had failed, and death took place in the following September.

Case 24. Edward McA., aged 41, laborer, was admitted into hospital October, 1857. There were strong tuberculous antecedents. His habits were intemperate; he was accustomed to take whiskey largely every day, often becoming intoxicated. He stated that six years prior to his admission, he had cough for three months, and lost twenty-four pounds in weight. He had also hæmoptysis. He kept about all the time excepting five weeks when he was an out-patient at St. Thomas's Hospital in London. He recovered at the end of three months and had continued to work up to October, 1857. At that time the cough had existed for a year. In October he was obliged to quit work on account of want of breath on exertion. He entered the hospital especially to be treated for ophthalmia, and was in the surgical service. Cod-liver oil was prescribed. Alcoholics were not given. He went out of doors freely. In August, 1858, I noted that he was not emaciated, and that his aspect was not notably morbid. He had night sweating. He had recovered from the ophthalmia, which was accompanied with ulceration of the cornea. The physical signs showed a considerable affection of the summit of the left lung. September 30, I noted that under the use of cod-liver oil and alcoholics moderately, he had much improved. My hospital service ended on that date. I noted subsequently that death took place in the November or December following.

The ages in the foregoing 24 cases varied between 47 and 16 years. Thirteen of the patients were men and 11 women. Five cases were in hospital, and 19 were in private practice. The occupations in the 13 male cases were as follows: Clerk, 2 cases; merchant, 3 cases; physician, 3 cases; waiter, 1 case; laborer, 3 cases, and in one case no occupation.

In 15 of the cases in private practice, the duration of the disease is determinable from the histories, either with exactness, or with a close approximation thereto. Now, it so happens that in these fifteen cases hygienic measures were employed, which would place these cases in the same category in this regard with the cases last studied, in which hygienic measures were employed without any medicinal treatment having reference to a curative influence. In order to endeavor to estimate whatever influence the cod-liver oil may have had in prolonging the duration of the disease, I propose to compare the duration in these fifteen cases with the duration in those of the other group just referred to, in which the duration was determinable. It so happens that the number of cases of the latter is only one under 15 cases, namely, 14. How then does the mean duration in fifteen cases treated with cod-liver oil, together with hygienic measures, compare with the mean duration in fourteen cases treated by hygienic measures without the cod-liver oil? The mean duration in the latter cases is a fraction over twenty-seven months (*vide* page 311). The mean duration in the cases treated with cod-liver oil, is nearly thirty-two and a half months. This comparison thus gives, as a result, an increase of the duration five and a half months by the use of the cod-liver oil.

The usefulness of the cod-liver oil is shown by the temporary improvement during its use, and by the tolerance of the disease. The study of the twenty-four fatal cases in which it was employed, furnishes, in this point of view, conclusive evidence of benefit derived from it. In not less than fourteen of the twenty-four cases it appeared to be more or less useful. In two cases (Nos. 7 and 14) the benefit was marked. In four cases the tolerance of the disease was apparently more or less due to it. Precisely how much influence it exerted in these cases severally, it would be, of course, impossible to say; but, considering that in so large a proportion of the cases there was either a temporary improvement, or good tolerance of the disease, during the periods in which cod-liver oil entered into the treatment, it seems fair to attribute to it a certain amount of beneficial agency.

The hypophosphites entered into the treatment in only three of the fatal cases. In one case it was taken for a short period only, and the case is among those treated with the cod-liver oil. In one of the remaining cases, the previous history exemplifies the apparent benefit of a sea voyage, and I give an abstract of the case chiefly on that account.

Mr. S. D. A., aged 28, merchant, residing in New York City, consulted me in January, 1862. His father and eight brothers or sisters had died with phthisis. I noted his previous history as follows: In 1854, he had a chronic cough, and his strength was much reduced. He went to Europe and returned well. In 1858 he became affected in the same way, and again went to Europe, returning well. His present cough began at about Christmas, 1860. His business had confined him much within doors. He was but little below his healthy standard of weight. His appetite and digestion were good. The physical signs showed a considerable affection at the summit of the left lung. He had taken the hypophosphites steadily for several months, and, as he thought, with benefit. He had now relinquished business, and was much out of doors. The date of his death and other details are not noted.

In the remaining case, the patient consulted me in August, 1867, and was occasionally under my observation afterward. Cough had existed for three months, having begun when he was travelling in Europe. The physical signs showed a moderate affection at the summit of the left lung. In October, 1867, I noted that he had improved, having been much out of doors, and taken alcoholics moderately with cough palliatives. In January, 1868, I noted that the improvement continued, and that he had taken the compound syrup of the hypophosphites with alcoholics moderately, and much out-of-door life. In the spring of 1868, he went to Cuba, where he had acute pneumonia. He recovered from this attack, returned home, and spent the summer in the country in Massachusetts. The pulmonary affection had increased, and the physical signs of cavities were now obtained. The voice had been husky for the past year or longer. He passed the winter of 1868–9 in New York, and the summer of 1869 in Massachusetts. In the winter of 1869–70, he had tubal nephritis, which ended in a chronic affection. He became dropsical, and died in July, 1870, uræmic convulsions preceding death.

Alcoholics used moderately, entered into the treatment in most of the fatal cases. That they were more or less useful, I do not doubt, but not in the sense of exerting a special influence upon the disease. As regards their usefulness, I would place them in the category with tonic remedies, such as quinia in small, or moderate, doses, and the chalybeates. The latter are doutless useful, but it cannot be claimed that they have any special or potential agency in arresting the disease or retarding its progress. Alcoholics, however, taken largely, appear sometimes to exert an influence upon the disease which is remarkable. Some of the cases in the groups respectively, in which recovery took place, in which the disease remained for a long time non-progressive, and in which it progressed very slowly, exemplified this apparent influence. Of the fatal cases, the histories of only three show alcoholics to have been taken largely. One of these cases affords an example of a prolonged duration of phthisis, under the free use of alcoholics together with hygienic treatment. Mr. K., architect, aged 26, was examined by me in July, 1862. Five years prior to this date he had a slight hæmoptysis. Cough did not begin until a year afterward. It had now existed for four years. At the time of the hæmoptysis he went to Europe, and remained there a year and a half. After his return he was much out of doors, but for the preceding two months he had been obliged to keep the house from weakness.

Chronic laryngitis had existed for three months, and his voice was now extinct. He was extremely nervous and timid; he had been two years in making up his mind to have me examine his chest. He was twenty pounds under his standard weight. The physical signs showed a large affection at the summit of the left lung, the cavernous signs being distinct. The upper lobe of this lung was so shrunken that cardiac impulses were felt in the 3d, 4th, and 5th intercostal spaces. The treatment had consisted mainly of the free use of alcoholics. Death took place a few weeks afterward. The duration, thus, was over four years.

The second case is in contrast with the foregoing, as regards the hygienic treatment. Mr. O., his age not noted, consulted me in February, 1862. Several members of his father's family had died with phthisis. He followed the sea for several years, and was wrecked in 1857, after which for several months his health was impaired, but he had no pulmonary symptoms. Cough had existed for two years. During the first year it was slight, and he thought lightly of it. In March, 1861, he had a profuse hæmoptysis, and afterward several recurrences, the hemorrhage being small. He stated that the pulmonary symptoms were always relieved after a hemorrhage. A year before the date of his consulting me, he had taken a clerkship, which had confined him constantly to the desk. He had been obliged to quit this occupation for the preceding two months on account of debility. He was thirty pounds under his weight of health. A perineal abscess, resulting in fistula, had occurred two months before seeing me. The treatment had consisted of the free use of alcoholics, and he was now taking a pint of whiskey daily. This quantity produced no excitation, but, as he expressed it, "kept him up." The physical signs showed a large affection, with cavities, at the summit of the right lung. Death took place shortly afterward.

The third case was in hospital practice. Patrick C., aged 16, was admitted in May, 1857. Cough had existed since the preceding February. The physical signs showed a large affection at the summit of the right lung. The expectoration became very copious, a pint in the twenty-four hours, and the cavernous signs were developed after his admission. The fingers were clubbed. The stomach did not tolerate the cod-liver oil, and the treatment consisted of the free use of alcoholics, the precise quantity not noted, together with palliatives of cough. Death took place in June, 1857.

In one of the fatal cases, alcohol and opium, in the form of the camphorated tincture of opium, were used very freely. Phœbe D., aged 35, was examined by me in April, 1858. Cough had existed for several months. She had recently returned from Cuba. She had become habituated to the use of the camphorated tincture of opium in large quantity—taking a quart daily. She took but little food, and was extremely nervous. The physical signs showed a considerable affection at the summit of the right lung, and contraction of the side from chronic pleurisy. Death took place several months afterward.

The following case illustrates improvement in hospital, and tolerance of phthisis, with intestinal ulcerations and grave syphilitic complications. the iodide of potassium entering into the treatment: James L., aged 20, was admitted in July, 1861. Cough had existed for two and a half years, and he had had hæmoptysis repeatedly. A year prior to admission he had lancinating pains in the left side of the chest, and shortness of breath; but he did not then, nor at any time, take to the bed. At about the time when the cough began, he contracted syphilis. His voice had been affected for a year, and on his admission it was extinct. He had had profuse night sweating. Under treatment with the iodide of potassium, tonic remedies, and alcoholics moderately, he improved greatly. His cough and expectoration were lessened, he gained in weight and strength, and he was able to act as helper to the orderly of the ward. There was great contraction of the left side of the chest, and solidification of the upper lobe of the left lung. He left the hospital in the summer of 1862, and returned in the following winter. During this winter he declined in health, and died in April, 1863. The post-mortem examination showed greatly diminished volume of the left lung; the pleural surfaces universally adherent; the upper lobe solidified by interstitial pneumonia with isolated small tuberculous nodules; the right lung containing a small cavity and tubercles in abundance; the larynx ulcerated, and one of the vocal chords destroyed; ulcerations in the ileum near the cæcum, and lardaceous liver, spleen, and kidneys.

Some of my cases were recorded at a period when blood-letting, together with depressing remedies, and severe counter-irritation were in vogue. The following four cases were treated thus antiphlogistically.

Case 1. S., aged 14, was seen by me January 1st, 1839. Six weeks prior to this date he had had hæmoptysis, and it had recurred twice. The physical signs an affection of the summit of the right lung. Death took place during an attack of profuse hemorrhage, February 11th, 1839. The treatment was venesection, which was employed three times, and leeches to the chest; digitalis in doses which reduced the frequency of the pulse; vesication and the application of the tartar-emetic ointment to the chest.

Case 2. E. H., aged about 40, was seen by me April 8th, 1846. He was apparently well prior to this month. On the 5th inst. slight hæmoptysis had occurred. On the 6th inst. it recurred, and the hemorrhage was more abundant. On the 7th inst. it continued, and the hemorrhage was profuse. Venesection was employed twice on the last date. On the 8th the hæmoptysis continued. There was notable dulness on percussion, and absence of respiratory murmur at the summit of the left lung. On the 24th of May I noted that the hæmoptysis had recurred repeatedly, and that venesection had been again employed. The digitalis had been continued, and mercury had been given. He was now quite feeble, but was able to drive out daily. Death took place June 12th, when he was dressed and sitting in a chair. The right lung contained numerous tuberculous nodules, with softened collection of the apex, and the left lung was crammed with miliary tubercles.

Case 3. C. H., aged 28, consulted me in 1842. Cough had existed for three months. It had been slight until within the preceding six weeks. The expectoration was now slight. The appetite and digestion were good, and his strength was not much impaired. The physical signs showed a moderate affection of the summit of the left lung. He was under my care for six weeks. The treatment consisted of a venesection to eight ounces, mercury in the form of the blue mass, the iodide of potassium, ipecacuanha and morphia. At the end of six weeks he passed under the care of another practitioner, and I noted simply that he died soon afterward, without any details.

Case 4. Miss O., aged 21, came under my care in April, 1840. She had at this time quotidian paroxysms of fever, which were arrested promptly by quinia. Cough had existed since February, and in June it had a violent paroxysmal character. She was much enfeebled; night-sweating was troublesome, and the appetite was greatly impaired. The treatment consisted of counter-irritation over the chest by means of the tartrate of antimony applied in an ointment, and sprinkled over a plaster, together with cough palliatives. In July she went to the Red Sulphur Springs, of Virginia, and died in the autumn following on board ship on her passage to Florida.

Of the fatal cases, in a few (4) the histories are deficient in information concerning the medicinal treatment. These cases, therefore, are of value only in respect of hygienic treatment. I shall give a succinct account of them.

Case 1. Mrs. S., residing in Buffalo, N. Y., was seen by me in February, 1849. Cough had existed for three years. Meanwhile she had had two children, the last having died when a few months old. This child she was obliged to wean on account of her debility, and she gained in weight and strength afterward. Chronic laryngitis had existed for several months, and this was the chief source of her present distress. Applications within the larynx of the nitrate of silver had produced no relief. She had kept the house for three months. The physical signs showed a considerable affection, with cavities, at the summit of the left lung. She passed the winter of 1849–50 at the South (place not stated), and died in April, 1850.

Case 2. Mrs. A., residing in Buffalo, N. Y., aged about 25, was seen by me in October, 1849. She had two children, the second two months old. Cough had existed for six months. She had been treated by a homœopathic practitioner. She had lost considerably in weight, and the countenance was pallid. She was still nursing, but the quantity of milk, which had been abundant, had diminished. The physical signs showed a considerable affection at the summit of the right lung. Weaning was advised, together with cod-liver oil, and out-of-door life. The fact of her taking the cod-liver oil is not noted. In January, 1850, I noted that her attending physician informed me she had improved progressively, and was then in New Orleans.

In June, 1850, I was informed by her attending physician in New Orleans that she had failed greatly, and had left with the hope, but hardly with the expectation, of reaching home. The date of death is not noted.

Case 3. John M., joiner, aged 25, residing in Buffalo, N. Y., consulted me in November, 1849. Cough had existed for eight months. He had lost considerably in weight, and his countenance was pallid. He had occasional night-sweating. The physical signs showed a large affection at the summit of the right lung. At the time of consulting me was continuing to work at his trade. The treatment is not noted, nor any further account of the case excepting that death took place in March, 1850.

Case 4. Mr. W., aged 31, portrait painter, residing in Buffalo, N. Y., consulted me in December, 1849. Cough had existed for four months. It was slight, and the expectoration small. He was five pounds under his weight of health. He had confined himself very closely to his studio. The physical signs showed a small affection at the summit of the right lung. He had been under the care of a homœopathic practitioner. He removed at once to one of the Southern States (either Georgia or Florida), and resided there until June, 1853. Meanwhile he married and had a child. He returned in an advanced stage of phthisis, and died a few weeks afterward.

Of the fatal cases, six were treated with the chlorate of potassa with a view to testing the value of this remedy. The remedy was also tried in 8 other cases. I communicated an account of these 14 cases in an article entitled "Clinical Report on the Treatment of Phthisis by the Chlorate of Potassa," published in the *American Journal of the Medical Sciences*, No. for October, 1861. I was led to make these experimental observations by a paper by the late Dr. E. J. Fountain, of Davenport, Iowa, which was submitted to the Section on Practical Medicine, at the meeting of the American Medical Association, in June, 1860. Dr. Fountain, in that paper extolled the chlorate of potassa as possessing curative efficacy in cases of phthisis. The cases under my observation, which were treated by this remedy, were in the Charity Hospital of New Orleans. On entering upon duty in this hospital in November, 1860, I adopted the following plan: Whenever cases of phthisis were admitted into my wards, the patients were at once, or soon after admission, placed under the use of this remedy, and it was continued as long as I was satisfied that they were not losing ground. When I became satisfied that they were losing ground, the remedy, as a rule, was discontinued. While the patients were taking the chlorate of potassa, I prescribed no other remedy excepting the syrup of morphia as a palliative of cough. I excluded alcoholic stimulants when I thought I could do so with propriety, but, in some cases, I did not feel at liberty to withhold these, and they were accordingly given while the patients were taking the chlorate of potassa. In all the cases the full diet of the hospital was allowed, and the patients were encouraged to be up, and to go out of doors whenever the weather and their strength permitted. I kept records of all the cases of phthisis received into my wards (containing about forty beds), during my winter's service. My article contained a condensed account of all the cases thus treated, namely, fourteen. I shall not reproduce this account here, but quote from my report the summary and conclusions:—

"The chlorate of potassa was given in most of the cases for several weeks. To be more precise, it was given for about a month in six cases; for two months in one case; for seven weeks in one case; for six weeks in one case; for twenty-four days in one case; for three weeks in one case; for two weeks in one case, and in one case for only ten days. The quantity given in the first three cases was three drachms, and in all the remaining cases half an ounce daily. A fresh solution was prepared each day and drank during the day. In all the cases the remedy was borne without inconvenience. It did not occasion diarrhœa nor any other unpleasant symptom, and the patients did not seem to acquire a repugnance to it. In all the cases, while the treatment by this remedy was continued, other medicines were not given excepting the syrup of morphia as a palliative for cough, and in seven of the cases a small quantity of brandy.

"Now, surveying these cases, what general conclusions are to be drawn respecting the influence of the remedy on the disease? In *nine* of the fourteen cases there are no grounds for supposing that the remedy exerted any salutary influence. In six of these nine cases the disease steadily advanced to a fatal issue, the patients dying in hospital. The histories of most of the fatal cases show that the remedy did not prevent the progress of softening, the formation of cavities, nor the fresh deposition of tubercle.

"In *five* cases, comparison of the condition of the patients before and after the use of the remedy, affords grounds for the supposition that the remedy may have exerted a salutary influence on the disease. These cases are Nos. 1, 3, 7, 8, 14.[1] Reverting to these cases severally, in Case No. 1 the patient for a month, while taking the remedy, appeared to hold his own. He began, however, to fail rapidly while taking the remedy, so that it was discontinued five days before death. The evidence of the value of the remedy afforded by this case is certainly not strong.

"In Case No. 3 the tuberculous disease had been of long standing, and was probably not progressive when the patient was admitted. He entered the hospital with dengue, and recovered from this affection with the tuberculous disease as it was previously. This case certainly affords no positive evidence of any influence exerted by the remedy on the tuberculous disease.

"Case No. 7 was under observation only for ten days. The patient entered just after journeying from Virginia to New Orleans. He improved during his brief stay in the hospital, but there is at least as much ground for supposing that the improvement was due to rest and the change of climate as to the chlorate of potassa.

"In Case No. 8 the chlorate of potassa was given for three weeks, and then discontinued in consequence of the want of evidence of improvement. Subsequently the remedy was resumed and continued for three weeks, and during this period the improvement was marked. In the mean time, however, the weather had become mild, and the sanitary condition of the hospital was improved by fewer inmates and freer ventilation. These circumstances render it doubtful whether much, if any, influence was exerted by the remedy.

"In Case No. 14 improvement was more marked than in any of the other cases. This was the only case in which the quantity of tuberculous deposit was small. The disease had existed for three months only. The chlorate of potassa was the only remedy given in this case, and it was given during the whole time the patient was in hospital, viz., two months. The only question in this case is, whether the improvement was due to the intrinsic tendency of the disease, together with the sanitary influences of the hospital and season, or whether it was attributable, in part or exclusively, to the remedy.

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[1] For a detailed report of these, and of all the cases, *vide* the article referred to.

"In view of the facts presented in this report, the following conclusions are submitted:—

"1. Of fourteen recorded cases of phthisis in which the chlorate of potassa was given in sufficient doses (℥ss *per diem* in eleven, and ʒiij *per diem* in three cases), and for a sufficient period to test its remedial power, in nine the histories afford no evidence of any salutary influence from the remedy; in four cases the circumstances render it doubtful whether much, if any, influence was fairly attributable to the remedy, and in one case only is there room for the supposition that the remedy was highly beneficial. These cases, therefore, fail to furnish proof of any special efficacy in this remedy to arrest or retard the progress of the disease.

"2. Inasmuch as in all these cases, save one, the quantity of tuberculous deposit was large or abundant, and in nearly all the disease had existed for a considerable period, it remains to be ascertained by further clinical researches whether different results may not be obtained by the use of the remedy in a series of cases in which the quantity of deposit is small and the previous duration of the disease short. In collecting such cases, accuracy of diagnosis is, of course, essential, and this can only be secured by the evidence afforded by physical signs in conjunction with the previous history and present symptoms. It may be added, in arriving at the conclusion that this remedy possesses no special influence in phthisis, it does not follow that it is not in a certain number of cases useful. By a special influence is meant a power to control, to a greater or less extent, the pathological processes which belong to this disease; a remedy may fail to do this, and yet be beneficial, as are a diversity of tonic remedies in cases of phthisis.

"3. The chlorate of potassa may be given in cases of phthisis to the extent of half an ounce *per diem*, with entire impunity, and without occasioning any unpleasant symptoms. It does not produce diarrhœa, and may be well borne when diarrhœa is present in cases of phthisis."

In leaving the treatment of fatal cases of phthisis, the following is a recapitulation of conclusions (exclusive of the foregoing relating to the chlorate of potassa), derived from the study of these cases:—

1. Phthisis, pursuing its course without either medicinal or hygienic treatment, ends fatally in a certain proportion of cases, after a duration varying between six months and twelve or fourteen years, the average duration being a fraction over thirty-nine months, this duration being irrespective of complications or intercurrent affections which tend to shorten life.

2. During the course of the disease in some fatal cases, without either medicinal or hygienic treatment, there is temporary improvement more or less marked as regards the general and local symptoms.

3. A comparison of the mean duration in fatal cases in which neither medicinal nor hygienic treatment was employed (excluding cases of from ten to twelve years' duration as belonging properly among the cases of slowly progressing phthisis, after the classification of cases which has been here adopted), with the mean duration in fatal cases in which hygienic treatment was employed, warrants the conclusion that by the latter life is considerably prolonged.

4. A comparison of the histories of a series of fatal cases in which neither medicinal nor hygienic treatment was employed, with those of a series in which hygienic treatment was employed, shows the much more frequent occurrence of periods of improvement as regards local and general symptoms.

5. A comparison of a series of fatal cases in which hygienic treatment was employed without medicinal treatment, with a series of fatal cases in which cod-liver oil was added to the hygienic treatment, affords evidence that life is prolonged by the cod-liver oil.

6. The greater number of instances in which temporary improvement takes place in the fatal cases treated with cod-liver oil, together with the marked improvement under its use in some cases, is evidence of its usefulness. With regard to the hypophosphites, the free use of alcoholics, and other measures of

treatment, the facts contained in the histories of the fatal cases are not sufficient to warrant any conclusions.

Treatment in Cases the Histories of which are Defective as regards either Duration or Termination.

I have thus far studied, with reference to treatment, cases distributed in the following groups: 1, those ending in recovery; 2, those in which the disease was arrested or non-progressive; 3, cases of slowly progressing phthisis, cured; 4, fatal cases. Exclusive of cases thus distributed, a large number remain which have not been included in either of the four groups in consequence of the histories being defective as regards either the duration of the disease or its termination. In these cases, of course, the influence of treatment on the duration of the disease, or its termination in either death or recovery, cannot be studied. They may, however, be studied with reference to the immediate apparent effect of treatment. Although the histories are incomplete, many of them embrace facts enough to show whether or not there was any improvement in the local or general symptoms, or whether the disease remained for a certain length of time stationary, instead of manifesting a steady, onward progress. Studying, in these points of view, the course of the disease, it may be practicable to draw some conclusions respecting the influence of the treatment. A considerable proportion of the cases, owing to my records embracing only the previous history and the present condition of the patient, are of no value in respect of study with reference to treatment. The number, however, is not small, the histories of which do contain information enough to promise some return for the trouble of analysis. For the sake of uniformity I shall arrange these cases, as I have arranged those already analyzed, with reference to treatment, as follows:—

1. The cases in which there was either no medicinal treatment, or none excepting tonic or palliative remedies, and no hygienic treatment.
2. The cases in which hygienic measures were employed without medicinal treatment.
3. The cases in which remedies were used with a view to a curative influence.

In the following eighteen cases, during the periods embraced in the histories, there was either no medicinal treatment, or none excepting tonics and palliative remedies; and no hygienic measures, such as a notable alteration of habits in respect of out-of-door life, change of climate, travelling, or removal of residence. Several of the cases were in hospital practice.

Case 1. H. F. L., aged 25, accountant, residing in Buffalo, N. Y., consulted me in April, 1856. Both parents, and, of a family of eleven children, seven, had died of phthisis. When eleven years old he had what was called white swelling of the knee, and was laid up for a year. He had had repeatedly hæmoptysis, not preceded nor followed by cough, the first attack having occurred fifteen years prior to the above date. Ten years prior to this date he had what was called "lung fever," and, after recovery from this, he spent eleven months at the South. Cough had existed since the autumn of 1855. He lost in weight during the autumn and early part of winter, but he had since gained, and now weighed more than at any time during the past four years. He had taken alcoholics moderately for the preceding six years. The physical signs denoted a considerable affection at the summit of the right lung, with cavities.[1] He had kept on steadily in his business, and had taken no medicines. In August, 1856, I noted that his general health during the summer had been good; that he had gained in weight, and his aspect was healthy. He had kept on as usual without medication. He had had a perineal fistula for six years, and was anxious to be cured of it. In November, 1856, I noted that he continued as well as at the last record.

In this case the disease was non-progressive and well tolerated for about a year, notwithstanding the sedentary occupation of the patient, and the evidence of a strong family predisposition to phthisis.

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[1] In the account of the cases of uncertain duration and termination, I shall state only the fact of a tuberculous affection, with the degree and stage as expressed by the terms small, moderate, considerable, large, and with cavity or cavities. I adopt this course for the sake of conciseness. The physical signs are noted in all the histories; and, in fact, the histories are fuller in these details than in any other. I shall also, as a rule, state only that there existed a small, or moderate, etc., affection of either the right or the left lung, as this will give, sufficiently for the present study, an idea of the amount of disease, and of ts progress.

Case 2. W. H. M., aged 32, farmer in Erie County, N. Y., consulted me in July, 1858. In the winter of 1854–55, he had cough, lost in weight, and kept the house most of the time during the winter. In the summer of 1855 he improved, and to some extent resumed work on his farm. He had hæmoptysis in September, 1855. He continued to work, considering himself not ill, but less vigorous than previously, until the autumn of 1857. His cough then returned, and he began to lose in weight. After February, 1858, he had repeatedly hæmoptysis. Of late his cough had diminished, and was now slight, and he had gained both in weight and strength. His aspect was not notably morbid. The appetite and digestion were fair. The physical signs showed a considerable affection at the summit of the right lung, with, probably, cavities. He had had no treatment excepting some cough palliatives, and had not taken alcoholics up to the date stated (July, 1858). This case belongs in the group of cases without medicinal or hygienic treatment. After this date the case belongs in the group of cases treated with alcoholics.

Case 3. Dr. E. P., residing in Western New York, aged 55, consulted me in July, 1859. He had been in the practice of medicine until within the past few years, when he had kept a country drug store. Cough had existed since February, 1859. His aspect was not morbid. He was not much under his standard of weight in health. The physical signs showed a moderate affection at the summit of the left lung. He had taken no remedies excepting palliatives of cough.

Up to this time, for five months, the affection apparently had been slowly progressing, with fair tolerance. The progress of the affection was afterward apparently more rapid under treatment with alcoholics and the hypophosphite of soda.

Case 4. Mrs. D. T. C., aged 38, residing in Belmont County, Ohio, consulted me in August, 1863. She had had cough most of the time during the preceding twelve years, and want of breath on exercise for several years. She had had eight children, the youngest being fourteen months old. One child was premature and died shortly after birth; the other children were large and healthy. She had nursed all her children, the last, however, for only a short time, owing to failure in the secretion of milk. In the autumn of 1862 she had an acute pneumonia, and since that time cough with abundant expectoration had continued. Meanwhile she had had hæmoptysis repeatedly. She was subject to irregularly recurring chills. The physical signs showed a considerable affection at the summit of the right lung. The patient stated that she was always better, as regards her cough, when pregnant. She had tried to take the cod-liver oil, but the stomach did not tolerate it. Tonic remedies and alcoholics, with life in the open air, were ordered. Under date of October, 1863, her attending physician wrote me that she had for a time improved somewhat, but appeared then to be declining.

It is probable that in this case phthisis had existed for twelve years. Assuming this, the case is interesting, first, as showing non-progression and tolerance, without treatment; second, as showing a series of pregnancies during this period, and, third, as offering evidence that pregnancy may in some cases tend to prevent the progress of phthisis.

Case 5. Mrs. R., residing in Vermont, aged 52, consulted me in September, 1863. Eighteen years previous to this date she had repeated attacks of hæmoptysis, with cough, emaciation, etc., and was considered hopelessly in consumption. She took very little medicine, but kept about, not materially altering her habits of life. She had never been free from cough, and at times the expectoration had been abundant. She was pallid and feeble, but continued to do a good deal of domestic work. There was notable dulness at the summit of the chest on the right side, with very feeble respiratory murmur; the vocal resonance and bronchial whisper were increased, and the heart-sounds unduly transmitted.

It is assumed as probable that in this case phthisis had existed for eighteen years, and, assuming this, the case illustrates non-progress of the disease for this long period, without hygienic or any medicinal treatment of importance.

Case 6. Mrs. S., residing in Pennsylvania, consulted me in September, 1863. Cough had existed for four years. Hæmoptysis had occurred repeatedly, but not within the preceding year. She had had diarrhœa for the preceding year; three or four dejections occurring daily. The expectoration was inconsiderable. The aspect was not notably morbid. The physical signs showed both lungs to be affected, the summit of the left lung being most so. She had had but one child, a daughter, now two years old. She had formerly taken alcoholics moderately, but not of late. I noted, in December, that her attending physician had informed me by letter that the diarrhœa had been relieved by bismuth and tonic remedies; that she had recently had hæmoptysis; that she had not continued alcoholics as I had advised, but had taken tonics; that her strength was good, and she was not much emaciated.

It may be assumed in this case that phthisis had existed, making little or no progress, for four years. Meanwhile she had borne a healthy child.

Case 7. Mrs. Dr. S., aged 35, residing in the western part of the State of New York, consulted me in May, 1864. Cough had existed for eight years. Soon after the commencement of cough she had hæmoptysis, which had since recurred repeatedly, being sometimes profuse. She was now up to her standard weight of health. The physical signs showed a moderate affection at the summit of the left lung. She had taken only tonic remedies. Alcoholics she had tried and they did not agree with her. The appetite and digestion had always been good. Her habits were active, and she was accustomed to be much out of doors.

It is inferred from the previous history in this case that phthisis had existed, without having been progressive, for eight years.

Case 8. I. S. B., aged 30, residing in New York City, hardware merchant, consulted me in November, 1865. Hæmoptysis had occurred several years prior to this date, without being either preceded or followed by cough. A year prior to date the hæmoptysis recurred, and recently there had been another recurrence, cough having existed since the last. There was not much loss in weight nor in strength. The appetite and digestion were excellent. There was notable dulness on percussion over the right scapula, with broncho-vesicular breathing and bronchophony. He was advised to take a voyage to Europe. I noted in January, 1866, that he did not follow this advice; that there had recently been an increase of cough and expectoration, but that his general condition was apparently improved. There was now notable dulness on percussion, with marked bronchophony in the right infra-clavicular region, the signs denoting solidification over the right scapula being still present.

This case affords an illustration of what is sometimes observed in cases of phthisis, namely, an increase of the local affection as denoted by physical signs, while the general condition would seem to denote improvement.

Case 9. Mr. McD., aged 41, clerk, residing in New York City, consulted me in June, 1866. Cough had existed since December, 1865. He had lost from twelve to fifteen pounds in weight. His strength had diminished, and his countenance was pallid. The physical signs showed a considerable affection, with cavities, at the summit of the right lung. He had been under homœopathic treatment. He had been a teetotaler, but he had recently taken alcoholics moderately. His condition had improved so that he had returned to his business which he had been obliged to relinquish on account of debility.

Case 10. Mrs. H. A. T., aged about 40, residing in Brooklyn, N. Y., consulted me in September, 1867. The physical signs showed a considerable phthisical affection, but no note of the case was made at that time. She visited me again with reference to the health of a daughter in July, 1868. She stated that directly after her consultation with me she began to use the Missisquoi water, and she continued its use during the winter. She had kept her room during the winter and spring. She had improved, as regards cough and expectoration, having gained also in weight and strength. The appetite and digestion were better, and, in short, she seemed almost well. Meanwhile she had become pregnant, and was now in the fifth month. She declared that her general health was better than for many years, and she attributed it to the use of the Missisquoi water. Aside from this, she had had no treatment. I made no examination of the chest on this date, and I have no further record of the case.

It may be assumed that in this case no influence on the disease, excepting, perhaps, a moral influence, is to be ascribed to the water, inasmuch as it has no medicinal properties.

Case 11. Mrs. Christiana W., aged 27, was admitted into the hospital of the Sisters of Charity, in Buffalo, N. Y., in January, 1849. Cough had existed for several months. She had lost considerably in weight. The expectoration was abundant. She had been confined to the bed for six weeks. There was dulness on percussion at the summit of the chest on the left side, with depression and tubular respiration. In June, 1850, I noted that this patient left the hospital after remaining a short time; that she recovered sufficiently to be about, and had frequently visited the hospital appearing and reporting to be in fair health.

There is reason to think that, in this case, at the time the patient was in hospital, she had an intercurrent (croupous) pneumonia.

Case 12. Eliza W., aged 27, domestic, was admitted into the hospital of the Sisters of Charity in Buffalo, N. Y., March 21, 1850. Her mother and a sister had died with phthisis. She stated that she was well up to three weeks before the date of her admission. She had daily chills, followed by fever without sweating. After her admission she had hæmoptysis. There was marked dulness over the left scapula, with bronchial respiration. She was treated with palliative remedies only, and it is noted that she left the hospital April 17, 1850, much improved.

Case 13. Jacob M., aged 32, laborer, was admitted into the hospital of the Sisters of Charity, in Buffalo, N. Y., in November, 1856. Cough had existed for three years. He had kept at work and did not consider the cough as of much consequence. Three weeks prior to his admission he had received a violent blow on the chest. After this he was bled and cathartics were given. He had not taken to the bed, and, as he thought, he would be able to keep at work were it not for pain in the chest, which he attributed to the injury. His aspect was not morbid, and his appetite was good. He had a moderate expectoration. The fingers were slightly clubbed. At the summit of the chest on the right side there was dulness on percussion, with broncho-vesicular respiration, bronchophony, bronchophonic whisper, and subcrepitant rales. Over the left scapula the physical signs showed moderate solidification of lung. He left the hospital November 30, feeling able to return to work.

It may be assumed, as probable, that phthisis had existed in this case for three years, the patient taking no remedies, and continuing steadily to work as a day laborer.

Case 14. R. H. B., aged 21, surveyor, was admitted into Charity Hospital, at New Orleans, in March, 1860. He stated that in April, 1859, he had typhoid fever and pneumonia. He then was in Minnesota. He had pleurisy four years prior to his consulting me. With these exceptions he had been well until August, 1859. He then had intermittent fever, which, after continuing for several weeks, was arrested by quinia. Diarrhœa followed, which lasted for two months, and during this period he began to cough. He had hæmoptysis shortly after the commencement of cough. In December he began to have pain in the back, which had continued and increased up to the time of his admission. He was quite feeble when admitted. His appetite was poor, and his aspect was pallid. The pain in the back was a prominent symptom, and there was an angular curvature at the last dorsal vertebra. There was much tenderness in this situation. The physical signs showed a small affection at the summit of the left lung. Soon after his admission he began to improve, and the improvement was progressive. He gained in a short time ten pounds in weight; the cough and expectoration were diminished, and he was employed in the mess room of the hospital. The angular curvature gave him no inconvenience, excepting when he maintained for some time the stooping posture. The pain and tenderness ceased. When he was first admitted, cod-liver oil was prescribed, but, as it disturbed the stomach, it was discontinued. The hypophosphite of soda was given for a short time, the reason for its discontinuance not being noted. The treatment, otherwise, consisted of alcoholics moderately, the compound tincture of cinchona for a short time, and palliatives of cough. March 26th, when my service ended, the patient was a ward nurse. He was active, and appeared quite well.

In August, 1861, I noted as follows: "I met to-day a young man named B., who said he was in the hospital in the session of 1859–60, and that I had recorded his case; that he had hæmoptysis and curvature of spine. He said his health was now very good, and he seemed to be well. My hospital records are packed. When I arrive in New York I must look up the case."

This case appears to illustrate an arrest, taking place without medicinal treatment, not only of the pulmonary affection, but of the process which had commenced and advanced to some extent in the dorsal vertebræ.

Case 15. John H., aged 40, laborer, was admitted into Bellevue Hospital in October, 1866. Cough had existed, with some intermissions, for about two years and nine months. He had continued, however, to work up to the day before his admission. His cough had lately increased, and he had had night sweating. Over the upper and middle third of the chest, on the right side, there was dulness on percussion almost amounting to flatness, with bronchial respiration and bronchophony, except that within a circumscribed space the breathing was cavernous, and over this space cracked-metal resonance was obtained by percussion. In two weeks this patient left the hospital feeling well enough to return to work. I noted at that time as follows: "This case is of interest as illustrating the existence of phthisis advanced to excavation, the patient all the while keeping at work as a laborer, and presenting at this time the appearance of health."

In January, 1867, this patient was again admitted into the hospital. He presented now essentially the same physical signs as in October, 1866. He was not emaciated nor feeble, and he had a healthy aspect. His pulmonary symptoms were slight. He now took for a time (it is not noted how long) the cod-liver oil. I have not noted how long he remained in hospital. In September, 1868, I noted that he was in hospital during the preceding winter; that he was somewhat run down when admitted, but he speedily improved and became quite fat. There was notable dulness on percussion at the summit of the chest on the right side, and the cavernous signs could not be obtained. I quote from my record as follows: "This case is a noteworthy example of improvement almost amounting to recovery, notwithstanding the amount of pulmonary disease, the improvement taking place in hospital under the use of tonic remedies."

Case 16. Bridget M., aged about 30, domestic, came to my clinic at the Long Island College Hospital, in May, 1862. She had kept steadily at work until within a week. Cough had existed for several years, and want of breath on exercise. She had never had rheumatism. There was marked dulness on percussion over the left scapula, with broncho-vesicular respiration. In the infra-clavicular region the resonance was vesiculo-tympanitic, and the respiration obscured by rales. She had a rough, aortic direct, and an aortic regurgitant murmur, with moderate enlargement of the heart. The citrate of iron and quinia was prescribed. In April, 1866, this patient came again to my clinic to be treated for intermittent fever. During the last four years she had worked most of the time as a domestic. The cough and expectoration were slight.

The coexistence in this case of valvular lesions and enlargement of the heart, with a small non-progressive tuberculous affection, is of interest with reference to the protective influence of the former against the latter.

Case 17. Mary J., aged 18, came to my clinic at the Long Island College Hospital in April, 1866. Cough had existed for eighteen months. Hæmoptysis had occurred about a year prior to the above date. There was marked dulness on percussion at the summit of the chest on the left side, with bronchial respiration, bronchophony, and bronchophonic whisper.

She was under my observation for six months, and the treatment consisted of tonic remedies. There was no appreciable change in her condition for four months. There seemed then to be a new invasion of disease, and at the end of the six months she was progressively failing.

Case 18. Thos. McI., aged 25, a seaman and cabinet-maker, having worked for the preceding eighteen months as the latter, was admitted into the hospital of the Sisters of Charity in Buffalo, in April, 1858. He had had hæmoptysis, first, four years prior to this date, not preceded nor followed by cough. It recurred a year afterward, his health meanwhile having been perfectly good. He continued to raise blood for three months at intervals of a few days, without any intervening cough, and his general health good. Two years prior to his admission, the hæmoptysis again recurred, and in the following six weeks occurred repeatedly. His strength became somewhat diminished, but he continued at work, going to sea, and employed in shipyards. A year prior to his admission he had another return of hæmoptysis more profuse than previously. Still no habitual cough. About two months before his admission another attack of hæmoptysis occurred, and was followed by cough. The hæmoptysis had recurred about twice a week. He raised half a pint of blood the day before his admission. His aspect was not morbid. The appetite was good. He was not much under his weight of health. The physical signs showed a moderate affection at the summit of the right lung. The patient left the hospital a few days afterward, feeling quite able to return to work.

This case might serve to illustrate the apparently conservative influence of bronchial hemorrhage in some cases.

In most of the foregoing eighteen cases of phthisis, the disease, during periods varying from several months to several years, was either non-progressive, retrogressive, or slowly progressive, with no treatment other than tonic or palliative remedies, and in several instances without even these, the patients either in hospital or at work as laborers, domestics, or in a sedentary occupation. It might be supposed that the cases had been selected to illustrate the facts just stated. It is, however, not so. I have examined the cases, the histories of which are defective as regards either duration or termination, and included in the foregoing group all which had either no treatment or none other than that first named. What conclusion shall be drawn from the facts which these cases exemplify? Shall it be concluded that, in a large majority of cases, phthisis, for a greater or less period, is most likely to be either non-progressive, retrogressive, or slowly progressive, with nothing but tonic or palliative remedies, or with none whatever, and without hygienic treatment, the patients persisting in laborious work, continuing in a sedentary occupation, or entering a hospital? Such a conclusion would not only be rationally repugnant, but it would not be in accordance with conclusions drawn from the study of other groups of cases. The facts which the analysis of these eighteen cases have developed, may probably be interpreted as follows: In most of these cases the disease did not tend intrinsically to progress, and there was a notable tolerance of it; hence, in several instances the patients did not give up to it and resort to treatment. The absence of treatment, therefore, under these circumstances, was not causative, but a consequence of the favorable course of the disease. If, on the other hand, the tendency of the disease had been unfavorable, the patients would have been led to seek remedial, and, if possible, hygienic treatment. This was the fact in some of the cases at a date subsequent to periods when the disease was allowed to pursue its course. Moreover, cod-liver oil, used at the time these cases were observed, as now, very generally in phthisis, was tried in some cases, and discontinued on account of its not being tolerated by the stomach. The facts which are exemplified in the majority of these cases are valuable as corroborating the evidence afforded by the analytical study of other groups of cases in behalf of the importance of what has been hitherto often referred to under the name intrinsic tendency of phthisis, and tolerance of the disease.

I pass now to the group of cases in which the treatment consisted exclusively, or chiefly, of hygienic measures.

Case 1. Mrs. W., residing in the country, in Western New York, aged 23, consulted me in October, 1857. She had lost two sisters with phthisis, one a twin sister, and her husband had died with it. Cough had existed for a year and a half. The expectoration was now considerable. She had steadily, but slowly, lost in weight, being now ten pounds under her healthy standard. The appetite and digestion were good. She had been subject to diarrhœa during the past year. She had habitual night-sweating. Chills had occurred repeatedly, which were arrested by quinia. She was a woman of much energy, determined not to die of consumption, and would hardly consider herself an invalid. The physical signs showed a moderate affection at the summit of the left lung. She had taken only tonic remedies, alcoholics moderately, and morphia at night. The hygienic treatment consisted of a change of climate, the patient passing the winters in Washington, D. C.

Case 2. Mr. C., aged 32, lawyer, residing in Western New York, consulted me in February, 1858. His father died with phthisis. Slight hæmoptysis occurred in September, 1857, not preceded nor followed by cough, and when apparently he was in good health. After this his strength diminished, and he lost in weight. He had been confined very closely to his office, but he began, four weeks before seeing me, to take active exercise out of doors. During these four weeks he had regained his strength and weight. He had never weighed more nor felt stronger than now. The physical signs showed a very small affection at the summit of the right lung. In July, 1858, I noted that he had had no return of the hæmoptysis, and that he had gained fifteen pounds in weight.

This case may be considered as illustrative of phthisis aborting under a change in habits of life as regards exercise out of doors.

Case 3. Rev. Mr. B., aged 35, residing in Buffalo, N. Y., consulted me in September, 1858. He had had a slight hæmoptysis in 1852, not preceded nor followed by cough, and he made no change in his habits of life. In the winter of 1857–58 he had two attacks of hæmoptysis. Meanwhile his health had been good, but afterward he had cough, and his weight decreased. He now travelled in the Southern States, and apparently recovered health. During the preceding summer he had considered himself well, but he had at times cough, and was a little below his standard of weight. His aspect was not morbid. He was not engaged in the duties of a clergyman, and spent several hours daily out of doors. The physical signs showed a small affection at the summit of the left lung.

This case illustrates phthisis ceasing from its incipiency to progress, under hygienic treatment.

Case 4. Mrs. A., aged 50, residing in New York City, consulted me in New Orleans, in January, 1859. Thirteen years prior to this date she had profuse hæmoptysis recurring repeatedly. She was bled, leeched, and took various remedies. She had not been free from cough since that time, and had always considered herself an invalid. Meanwhile she had had ten children. Most of the time since the first hæmoptysis she had spent either in Europe or in travelling. She had crossed the Atlantic ocean ten times in thirteen years. She had now considerable *embonpoint*, her weight being 160 pounds. She was much in the open air, lived generously, and for many years had taken very little medicine of any kind.

I assume it as probable, in this case, that phthisis had existed for thirteen years, not progressing during this period, the patient meanwhile becoming the mother of a large family. My record does not contain any statement in regard to the health of the children.

Case 5. J. H. H., aged 33, from Tennessee, consulted me, in New Orleans, in February, 1860. He had hæmoptysis in April, 1859, supposing himself to be in perfect health. Cough began a few weeks afterward. His aspect was healthy. He had passed a portion of the preceding summer in Minnesota. He was now on his way to Texas, with a view to settling there, and engaging in the business of raising cattle. The cough and expectoration were slight. He had not lost much in weight. The appetite and digestion were excellent. His habits were active, and he was out of doors much of the time. He had taken no medicine.

He took alcoholics moderately. The physical signs showed a considerable affection at the summit of the right lung.

This case afforded a contrast between the amount of disease as shown by the physical signs, and the pulmonary symptoms together with the general condition.

Case 6. Mr. M., harnessmaker, aged 34, having resided in Illinois and Kentucky, consulted me at New Orleans, in December, 1860. A year prior to this date he contracted syphilis. He had had an eruption which was considered syphilitic. Hoarseness had existed for some time. The duration of cough was not noted. The physical signs showed a moderate affection at the summit of the left lung. He consulted me again, at New Orleans, in December, 1860. Meanwhile he had, as a hygienic measure, lived much out of doors, and since the previous August he had been shooting on the prairies. The cough and expectoration were now slight. His weight was less by only two pounds than a year previous. His appetite was good; his general aspect was healthy, and his strength was nearly or quite up to that of health. The physical signs showed no increase of the pulmonary affection.

Case 7. Fitzhugh B., aged 20, consulted me in November, 1861. Two years prior to this date he had slight hæmoptysis; another in May, 1861, and within the preceding few weeks, it had recurred several times. Shortly prior to the recent recurrences cough began, and it had continued. He was pursuing collegiate studies in the western part of Massachusetts, with a private tutor, applying himself four hours daily, and taking much exercise out of doors. He was taking no medicine, and had not taken alcoholics. He had recently gained in weight and strength, and his cough had ceased. He declared that he never felt in better health. The physical signs showed a moderate affection of the summit of the right lung. In February, 1862, I noted that a relative of the patient, a physician, informed me of his having entered the army, and that he was then in active service.

Case 8. Mr. M., aged 18, residing in Rhode Island, consulted me in February, 1862. Cough and expectoration had existed for four years. He was thin, and his aspect was delicate, but he was able to be about and to take considerable exercise. The physical signs showed a considerable affection with cavities at the summit of the left lung. Prior to this date he had taken the cod-liver oil jelly. In May, 1862, I noted that he had much improved. The cough and expectoration had diminished. The appetite and digestion were good. The treatment, since the former consultation, had consisted of alcoholics moderately, with generous living and out-of-door life. In March, 1863, I noted that he had just returned from the West; that he had continued as well as at the preceding record until recently, when he had declined in appetite and strength.

Case 9. Mr. G., aged 17, clerk, residing in Brooklyn, N. Y., consulted me in November, 1864. Cough had existed for two months. His aspect was not notably morbid. The physical signs showed a moderate affection at the summit of the left lung. I noted in October, 1865, that shortly after the above date he took a sea voyage, returned and died in the summer.

Case 10. Mr. B., residing in New York City, aged about 30, consulted me in May, 1865. At this time he had hæmoptysis which recurred daily for several days. Cough and expectoration had existed for several months. He had been under homœopathic treatment. The physical signs showed a moderate affection at the summit of the right lung. I noted in October, 1865, that he went shortly after the above date to Minnesota, and improved greatly, his pulmonary symptoms having nearly disappeared.

Case 11. Mrs. O., aged about 35, consulted me in September, 1866. Her father died with phthisis. Cough and expectoration had existed for four years. During the greater part of this time the voice had been husky. She had been treated for the laryngeal affection by Fauvel in Paris and Simrock in New York. She had been in Europe for a considerable period. The preceding winter was passed in Algiers. She lived much out of doors. Alcoholics had been taken sparingly. Her aspect was healthy. The pulmonary symptoms were slight. The appetite, digestion, and strength were good. There was dulness on percussion at the summit of the chest on the left side, with feeble and broncho-vesicular respiration, subcrepitant rales, and undue transmission of the heart-sounds. She had been examined by Baron Louis and Trousseau in Paris.

It is assumed that in this case, phthisis had existed for four years, having for a long time remained non-progressive.

Case 12. Mr. M., age not noted, confined to a dry goods store in the country, in New Jersey, prior to the last two years, consulted me in October, 1866. Hæmoptysis had occurred seven or eight years previously. Prior to this date, and afterward, cough had existed frequently but not constantly. It had been continuous for the past year, and it was now attended with considerable expectoration. He had had several recurrences of hæmoptysis. He was now up to his best weight in health, having gained fifteen pounds during the preceding summer. The physical signs showed a considerable affection with cavity at the summit of the right lung. This patient passed the winter of 1864–65 in St. Paul, and the winter of 1865–66 in Winona, Minnesota, without improvement. During the preceding summer, passed in New Jersey, he had improved notably.

Case 13. C. H. H., aged about 30, broker, from Tennessee, consulted me in October, 1866. His voice was husky, and had been so for the past year. The date of the commencement of cough is not noted. His aspect was not morbid. He was not much below his healthy standard of weight, and his strength was good. The physical signs showed a considerable affection, with cavity, at the summit of the left lung. He had crossed the Atlantic Ocean several times, and always with benefit. The preceding spring he passed in Minnesota, and, as he thought, without benefit.

Case 14. Mr. B., aged 39, residing in Rhode Island, consulted me in September, 1867. Cough and expectoration had existed for nine years, and he had many recurrences of hæmoptysis. During the greater part, or all, of this period, he had kept about, and travelled as an agent for the sale of jewelry. He had passed one summer in Minnesota. For the preceding five months his voice had been husky. His appetite and digestion were fair. He was rather feeble, but he was still engaged in his business. The physical signs showed a considerable affection, with cavity, at the summit of the left lung. I noted, in March, 1868, that this patient had recently called on me, and was about to sail for Nassau, N. P. He was much emaciated and feeble, and his voice was extinct.

Case 15. O. J. M., lawyer, aged 32, from Canada, consulted me in February, 1868. Cough and expectoration had existed for several months. His general health had not been good, but without any definite ailment, for a year prior to the commencement of cough. He was but little under his weight of health. His strength was not much impaired. His appetite was poor. He was troubled with dyspeptic disorders, and with alternating constipation and diarrhœa; also, with night sweating. The physical signs showed a moderate affection at the summit of the right lung. In April, 1868, I noted that he saw me on his way to Canada, having passed the spring in Florida, on the St. John River. He stated that he encountered there a host of invalids, most of whom, as he thought, did not improve. He had, however, not lost ground, and he had gained a little in weight. The physical signs showed no increase of the pulmonary affection.

Case 16. C. H. M., aged 25, residing in New York City, brush maker, consulted me in March, 1868. He stated that he had pleurisy a year prior to this date, followed by cough and a perineal fistula. The latter, after several operations, had been cured. Cough had continued with considerable expectoration. He was fifteen pounds under his healthy standard of weight. The appetite and digestion were good. The physical signs showed a moderate affection at the summit of the right lung. He had tried to take cod-liver oil, but his stomach did not tolerate it. In July, 1868, I noted that he went to Norfolk, Va., directly after consulting me, and lived in the open air. He gained at once in weight and strength. He then went to New Orleans and Havana, and lost what he had formerly gained in weight. His aspect was now better than in March, the cough and expectoration being about the same. He had taken no medicine. He returned to, and passed the summer in, Norfolk. In September, 1868, he came to New York. He had gained in weight, and his aspect was healthy. The cough and expectoration were about the same. The physical signs rendered probable the existence of cavities at the summit of the right lung.

Case 17. Mr. A., aged 27, broker's clerk, consulted me in November, 1868. I had examined him in July, 1865, but did not note the symptoms and signs. The evidence of phthisis, at that time, was unequivocal. He had shortly before been wrecked at sea. After my examination he went to California, making the voyage around Cape Horn, and he travelled in Europe. He had been away until January, 1868, when he returned to his duties in Wall Street. He had never been entirely free from cough; but during the spring months he had frequent "colds," and, of late, cough had been troublesome. His strength had diminished. Appetite and digestion hitherto and now were good. The physical signs showed cavities at the summit of the left lung. He stated that his cough heretofore had always been slight, and he had gained in weight and strength when at sea. In May, 1869, I noted that shortly after seeing me in November, 1868, he sailed for Europe. He spent some time in Nice, and the greater part of the winter in Geneva, Switzerland. He had recently returned to New York. He had now very little cough and expectoration. He had held his own as regards weight and strength. The appetite and digestion were good. I noted in May, 1871, that he subsequently died, without noting the date of his death.

Case 18. Rev. Mr. D., Catholic priest, residing in New York City, aged about 25, was seen by me in June, 1870. He was then quite feeble, keeping the bed most of the time. His pulse was 120. The physical signs showed considerable solidification at the summit of the right lung. The date of the commencement of cough was not noted. He shortly afterward went to Lake George, and lived in the open air. He returned to New York in September. He had gained notably in strength, being now able to be about, and his aspect was much improved. The physical signs showed still considerable solidification at the summit of the right lung; the pulse was still 120 per minute, and the axillary temperature was 101.50°.

I appended to the record as follows: "This case illustrates improvement in the general condition, under open-air treatment, with no evidence of local improvement."

Case 19. F. A. McC., clerk, aged 35, residing in Washington, D. C., consulted me in September, 1870. Huskiness of voice had existed for eighteen months. The laryngitis was preceded by slight cough which he did not consider of importance. The physical signs showed a moderate affection at the summit of the left lung. I quote the following from my record: "This case is noted with reference to the apparent benefit of hydropathic treatment. Four months before seeing me he was told by a prominent physician of this city, that his case was hopeless. He immediately went to a water cure in this city, and had remained there. He had gained in appetite, weight, and strength. He had never had syphilis. The condition of the voice was not improved.

Case 20. Mr. T., aged 41, from Indiana, railroad superintendent, date of consultation not noted. Cough had existed much of the time for seven years. Two and a half years prior to the date of his seeing me, he spent eleven weeks in New Mexico, and lost his cough, improving also in weight and strength. He supposed himself to be well, but he began to decline after returning home. He was now thirty pounds under his weight of health. He was pallid, but not notably feeble. The appetite and digestion were good. The physical signs showed a considerable affection, with cavity, at the summit of the right lung. He was on his way to Texas.

Case 21. C. A. R., aged 24, consulted me in October, 1870. Fourteen months prior to this date he had hæmoptysis not preceded nor immediately followed by cough. The hæmoptysis had recurred about once a month, having been sometimes profuse and sometimes slight. Cough and expectoration had existed for about nineteen months. When attacked with hæmoptysis he was a dry goods clerk. During the preceding summer he had given up his business, and lived out of doors taking active exercise in rowing and hunting. He lost in weight in the spring, but he had regained what he had lost during the summer. The appetite and digestion were good. The physical signs showed a small affection at the summit of the left lung, with obstruction of the left primary bronchus.

Case 22. George F., aged 25, keeper of a drinking saloon in Buffalo, N. Y., consulted me in April, 1846. Cough had existed during the winter, but he had not attached enough importance to it to consult a physician. The appetite and digestion were good. The physical signs showed a moderate affection at the summit of the left lung. He went to Iowa and passed the summer there. In October, 1846, he returned, his pulmonary symptoms and general condition denoting no progress of the disease. He had taken no medicine.

Of the 22 cases in the foregoing group, in no case, save one, was the disease steadily and rapidly progressive during the periods which the histories embrace. In 20 of the 21 cases, during these periods, ranging from several months to many years, the disease was either non-progressive or very slowly progressive, the treatment embracing, together with hygienic measures, only tonics or palliative remedies, or none whatever, alcoholics, if taken at all, being used moderately. This result of the analysis I could not have foreseen, and I desire to state explicitly that there was no selection of these cases, all in which the treatment was hygienic, without important remedies, having been embraced in the group. Not looking beyond this group of cases, shall it be said that in the proportion of 21 out of 22 cases, chronic phthisis will be either non-progressive or will progress very slowly for an indefinite period, provided nothing but tonic and palliative remedies be given, and certain hygienic measures be employed? This would be, I believe, an unwarrantable conclusion. The explanation given for the result of the analysis of the group of cases preceding this, is, probably, equally applicable here. The cod-liver oil would doubtless have entered more or less into the treatment of most of the cases, were it not that the disease did not manifest a tendency to progress, and it is, perhaps, to be added, were it not that the reliance was upon the hygienic measures. Moreover, in some of these cases the cod-liver oil was tried and not well tolerated.

A comparison of this group of cases with the group preceding it, is of much interest. The two groups are in the same category as regards medicinal treatment, the contrast between them relating to the absence of hygienic measures of treatment in the former, and their employment in the latter, group. The number of cases in the two groups, is not far from equal, namely, 18 in the former, and 22 in the latter. A comparison of the two groups is of interest as bearing on the influence of hygienic measures in preventing or retarding the progress of chronic phthisis. I find it difficult to express the result of a comparison in figures or any exact statements of quantity; but that the comparison affords evidence of a favorable influence by hygienic treatment is certain. The comparison shows a less amount of influence than might have been expected. The conclusion to be drawn from this fact is, that we are apt to place to the account of hygienic measures of treatment a certain portion of the influence which belongs to the intrinsic tendency of the disease.

It remains to study the cases in the third group, namely, those in which remedies were employed with a view to a curative influence.

The cases in this group are not few in number, and I should be glad to spare the reader the tediousness of an abstract of each case separately. After attempting to give only the results of an analysis of the cases, however, I concluded that it would be more satisfactory to introduce a synopsis of them severally. I shall abbreviate details, in so doing, as much as possible.

The treatment in these cases, aside from hygienic measures, consists chiefly of the cod-liver oil, the hypophosphites, and alcoholics in large quantity. Thus far, I have always referred to the cod-liver oil as a remedy, without raising the question whether it is properly to be considered as such, or as a food. That its use comes properly under the head of the dietetic treatment—in other words, that it is not a drug—seems to me the correct view, but it is most convenient to consider it as a remedy, and I do so for that reason. The question might, perhaps, be raised with respect to alcoholics, whether it be proper to consider them in the light of a remedial agent. I have done so thus far, for convenience, provided they are given largely. Taken in small or moderate quantity, I have considered them as belonging to dietetics. I shall divide the cases to be now introduced, into, 1st those treated with cod-liver oil; 2d, those treated with the hypophosphites; and 3d, those treated with alcoholics, arranging under distinct heads the cases in private and in hospital practice.

Cases treated with Cod-Liver Oil in Private Practice.

Case 1. I. C., aged about 25. Western New York, November, 1851. Family predisposition. Cough for six months, and considerable affection at summit of left lung. Went South. Noted in March, 1852, that he had greatly improved, his pulmonary symptoms slight, and his weight at the standard of health.

Case 2. Mrs. V., aged 24. Buffalo, New York. Family predisposition. March, 1853, cough for six months. Had kept the bed, under medical advice, for three months. Began to sit up, and to go out of doors. Went to the city of New York, and was absent several weeks. Steady improvement until her return in July. At this time a large affection at summit of right lung. Declined and died in winter of 1853–4.

Case 3. Mr. B., aged 21, school teacher. July, 1857. Hæmoptysis in Peekskill, N. Y., eleven months prior to above date. Venesection fourteen ounces. Cough had then existed for several weeks. Only five pounds under weight of health, and strength but little diminished. In October, quotidian chills, with fever and sweating; arrested by quinia. Considerable affection at summit of right lung. Had given up teaching and been in the open air. Blisters and iodine had been applied to the chest, and alcoholics taken moderately.

Case 4. Mr. M., sadler, Buffalo, N. Y., aged 32. May, 1857. Hæmoptysis nine months prior to above date, and, meanwhile, ten or twelve recurrences. Cough since the first hemorrhage. Recently two attacks of hæmoptysis, one being profuse. Had kept at his business up to May, 1857. Weight diminished ten or fifteen pounds. A considerable affection at summit of left lung. In addition to cod-liver oil, took glycerine, tonics, and alcoholics moderately. Went into the country, and in August, 1857, cough and expectoration were slight, and the general health good.

Case 5. Mr. ———, of Canada, aged 23, bookseller. February, 1858. Cough and expectoration for two years. After the first three months, improvement, and he had regained his general health, only slight cough and expectoration remaining. Aspect healthy. A considerable affection at the summit of the right lung. He had continued in his business. He came to me for an opinion as to the existence of pulmonary disease, having had medical opinions which were discrepant.

Case 6. Dr. K., aged 23. Canada. Family predisposition. Cough for two years. He had lost in weight, and regained it in part. Aspect not morbid. He had expectorated some calculi. He had kept the house during the winter. A moderate affection at summit of left lung.

Case 7. Michael K., aged 33, Erie County, N. Y., carriage maker. June, 1858. Had had profuse hæmoptysis ten years prior to this date. Duration of cough not noted. He had now considerable expectoration. He had kept pretty constantly at work in his business. A considerable affection at summit of right lung. In August, 1858, he reported much better, having now very little cough and expectoration. In addition to the cod-liver oil, he had taken beer pretty freely. Previously he had taken neither cod-liver oil nor alcoholics.

Case 8. S. F. L., machinist, aged 30, Buffalo, N. Y. June, 1858. The voice became hoarse four months prior to above date, and had so continued. Said he had no cough nor expectoration. His weight had not decreased. Appetite and digestion good. He had kept steadily at work. There was marked dulness on percussion at the summit of the chest on the left side, with deficient superior costal movements, broncho-vesicular respiration, vocal resonance greater than on the right side, and undue transmission of the heart-sounds. He had already taken the cod-liver oil for several weeks. In July, 1858, reported by letter that he had gained in weight, had no cough, and his voice remained unchanged.

Case 9. C. A. K., western New York, aged 25, druggist and confined to his store. July, 1858. Cough for six weeks. Had lost in this time twelve pounds in weight. Slight hæmoptysis. A considerable affection at summit of right lung. In March, 1859, I was informed that he was in good health, looking well and reporting that he was never better. In April, 1859, his physician wrote me that he seemed to be well.

Case 10. Mrs. B., Michigan, aged 24. August, 1858. Cough and expectoration had existed for four years. Hæmoptysis repeatedly. Much loss in weight. Appetite and digestion generally good. Had had irregularly occurring chills. Occasional night sweating. She had taken for a considerable period the cod-liver oil. A considerable affection at the summit of the right lung.

Case 11. Chas. C. C., Illinois, aged 33. No family predisposition. For the five preceding years clerk, and habits sedentary. January, 1860. Cough for seven months. Repeatedly hæmoptysis. A considerable affection at the summit of the right lung. He had already taken cod-liver oil and the hypophosphites. Had also changed his sedentary habits for much out-of-door life. Alcoholics moderately. He had greatly improved. He was on his way to Texas to reside there if he found the climate favorable. In June, 1860, he reported by letter that he had held his weight, but his muscular strength he thought had somewhat diminished. In other respects no material change. He had taken steadily the cod-liver oil and the hypophosphites.

Case 12. Mr. C., Wisconsin, aged 40. October, 1865. Cough four months. Had lost twenty pounds in weight. Aspect not notably morbid, and fair muscular strength. About three and a half years prior to above date, had a fistula in ano, which was cured by a seton. A considerable affection, with cavernous signs at the summit of the right lung. Had taken alcoholics moderately, and no medicine. In March, 1866, noted that he went to London, and returned in a sailing vessel. Improved during the outward voyage, gaining ten pounds in weight. He had taken the cod-liver oil by advice of Dr. Thomson, of Brompton Hospital. The signs showed no increase of the pulmonary affection.

Case 13. Mary A., chambermaid, New York City. October, 1866. Previous duration of cough not noted. A moderate affection at summit of left lung. In addition to the cod-liver oil, a chalybeate tonic and alcoholics moderately. In April, 1867, noted that she had progressively improved, and had a healthy aspect, the signs of an affection at summit of left lung remaining. She had kept constantly at work as chambermaid.

Case 14. S. C. A., lawyer, aged 30, New York City. September, 1869. Details of previous history not noted. Now, the left side of the chest much contracted; at the summit on this side amphoric resonance on percussion, and cavernous breathing. Over the greater part of this lung the signs denoted solidification. At summit of right lung feeble respiration, and moist rales in abundance; over the middle and lower third of chest on right side the respiratory murmur vesicular and intense. With this extensive pulmonary affection the general condition was fair. He was not much emaciated. His aspect was not notably morbid. The appetite and digestion were fair. He had taken cod-liver oil often and freely, and no other remedies; alcoholics, also, the quantity not noted.

Case 15. E. H. C., aged 35, clerk, New York City. No family predisposition. September, 1870. Cough for three and a half years, *i. e.* since spring of 1867. Hæmoptysis a month after the commencement of cough. Lost in weight, in summer of 1867, ten pounds. Gave up his business, and was much out of doors. Sailed for China in August, 1867, and gained during voyage twenty-five pounds, the cough becoming insignificant. Remained in China until March, 1868, and then went to San Francisco. Lost ground when in China and on the return voyage. Came to New York in May, 1868. During the following summer did light work, and took cod-liver oil. Passed the winter of 1868–69 at Babylon, L. I., continuing the cod-liver oil. Cough was slight. Spent summer of 1869 at St. Paul, and did not lose ground. In winter of 1869–70 was clerk in a club house in New York City, doing much work at night. Continued the cod-liver oil, and took alcoholics rather freely. During this winter gained in weight, and became heavier than he had ever been. After February, 1870, lost in weight what he had gained in the winter. In September, 1870, he had lost thirty pounds. Had left the club house on account of severe work, and was clerk in a railway office. Appetite and digestion were good. His aspect was not morbid. A considerable affection, with cavernous signs, at the summit of the right lung.

A reviewal of the facts in the foregoing fifteen cases gives the following: There was notable improvement as regards the local symptoms, and the general condition in eight cases, namely, Nos. 1, 4, 7, 8, 11, 13, and 15. Of these eight cases important hygienic measures entered into the treatment in three, namely, Nos. 1, 4, and 11; there was no material change in the habits of life in four cases, namely, Nos. 7, 8, 9, and 13, and in one case, No. 15, during a portion of the time that the patient was under observation, improvement took place under unfavorable hygienic circumstances. In five cases the disease manifested little if any evidence of progress, namely, Nos. 3, 5, 6, 7, and 12; in two of these cases, hygienic measures entered into the treatment, namely, Nos. 3 and 12; in two cases, Nos. 5 and 7, there was no material change in the habits of life, and in one case, No. 6, the patient kept within doors all winter. The disease manifested steady, but slow, progress in one case, No. 10, and in one case, No. 14, there was notable tolerance of the disease.

In order to determine the amount of favorable influence attributable to the cod-liver oil, it is necessary to know how much is to be attributed in certain of the cases to the hygienic treatment, and, in all the cases, how much to the intrinsic tendency of the disease. And inasmuch as it is impossible to estimate these two factors, in individual cases, with anything like exactitude, it follows that we cannot judge with accuracy of the influence of the cod-liver oil. It is, however, fair to infer that the latter was not without a certain amount of influence. This may be inferred especially from the facts in the cases in which there was no material change in the habits of life, namely, Nos. 5, 6, 7, 8, 9, 13, and 15. These cases may be referred to as illustrating the apparent usefulness of the remedy.

Cases treated with Cod-liver Oil in Hospital Practice.

The number of cases in hospital practice being considerable, it may be of interest to study them separately, in view of the fact that they may be considered as being under uniform hygienic circumstances.

Case 1. Henry M., aged 30, admitted (Buffalo) November 2, 1850. Had syphilis a year previously, and gonorrhœa, with bubo, followed by sore throat, for which mercurial treatment was employed. Considerable expectoration. Duration of cough not noted. He declared that he had no cough, and was determined in the belief that the matter expectorated came from the stomach. There was dulness on percussion at the summit of the chest on the right side, with tubular respiration, and the heart-sounds were unduly transmitted. At the summit on the left side of chest subcrepitant rales. He had no treatment but the cod-liver oil. Noted that he left the hospital December 15, 1850, much improved.

Case 2. John M., aged 29, laborer, admitted (Buffalo) November 10, 1849. Cough since the preceding spring. Had kept the bed for six weeks prior to admission. Considerably emaciated; pallid; appetite poor. A large affection, with cavernous signs, at summit of left lung. Left hospital after ten weeks unimproved.

Case 3. Katherine G., aged 15, admitted (Buffalo) November 13, 1849. Cough for four months. Expectoration now abundant. Habitual night sweating. Not great emaciation. A considerable affection at the summit of the right lung, and a moderate affection at summit of the left lung. The patient progressively declined, and at the date of the last record, December 1, 1849, was extremely feeble, being confined to the bed, the pulse 120, and the respiration 32 per minute.

Case 4. John C., aged 41, laborer, admitted (Buffalo) December 15, 1849. Cough since the preceding June or July. Not much loss in weight. Appetite good. A considerable affection at the summit of the right lung. The improvement was marked and progressive. At the date of the last record, January 4, 1850, noted that the patient felt that he would be well enough to return to work were he not wanting in breath on exercise.

Case 5. Caroline D., aged 21, domestic, admitted (Buffalo) in February, 1851. Cough since the preceding autumn. Not much loss in weight. Appetite not good. A considerable affection at summit of the left lung. Noted, March 4, that she was much improved. No further record of the case.

Case 6. Felitia K., aged 17, domestic, admitted (Buffalo) January 25, 1853. Cough for six weeks. A considerable affection at the summit of the left lung. Appetite fair. March 9, noted that she had declined, anorexia and vomiting being now prominent symptoms. On the 10th March, left hospital to go to her friends.

Case 7. Dennis B., aged 26, ostler, admitted (Buffalo) in September, 1851. Cough for two months. Had lost fifteen pounds in weight. Aspect not notably morbid. Appetite fair. Occasional night sweating. A moderate affection at the summit of the right lung. The improvement was marked, and the patient left hospital December 1, 1851, feeling able to return to work.

Case 8. James P., aged 20, laborer, admitted (Buffalo) September, 1852. Cough for fourteen months. Had continued to work until seven weeks prior to his admission, and was obliged to quit work then on account of want of breath on exertion. Appetite fair. Lately, night sweating. Had lost about fifteen pounds in weight. A considerable affection at the summit of the right lung. Left hospital much improved. December 13, 1852, the physical signs remaining the same as on his admission.

Case 9. Cornelius O'D., aged 31, laborer, admitted (Buffalo) in October, 1852. Cough for two months. Had quit work about a month before his admission. Had lost considerably in weight. Night sweating. A considerable affection at the summit of the right lung. At date of the last record, December 20, 1852, he had not improved.

Case 10. Edmund W., aged 23, laborer, admitted (Buffalo) in October, 1852. Cough for three months. Had quotidian paroxysms of fever, supposed to be malarial, after his cough commenced. They were arrested by medicine. He had been bled and blistered before his admission. Had lost considerably in weight. A considerable affection at the summit of the left lung. At the date of the last record, December 20, 1852, he had progressively failed.

Case 11. Patrick J., aged 16, waiter, admitted (Buffalo) February 15, 1853. Cough for two months. A moderate affection at the summit of the right lung. Left hospital March 13, 1853, improved.

Case 12. Patrick C., aged 27, stonemason, admitted (Buffalo) March 16, 1853. Had cough in the preceding July, which disappeared entirely, and returned shortly before his admission. Had hæmoptysis since before his admission, and once afterward. Voice husky. A small affection at the summit of the right lung. Left hospital April 11, 1853, free from cough, and feeling able to go to work.

Case 13. Eliza T., aged 30, domestic, was admitted (Buffalo) in November, 1852. At the time of her admission she complained only of headache and loss of appetite. Cough began three weeks after her admission, at first slight and dry, with progressive increase, and expectoration. The physical signs were noted first in April, 1853. They then showed a small affection at the summit of the left lung. The local and general symptoms denoted progress of the disease up to the date of the last record, April 17, 1853.

Case 14. James C., aged 37, admitted (Buffalo) March, 1853. Cough for two years. Hæmoptysis twice. Frequent night sweating. Progressive loss in weight. Hoarseness for past two months. Noted subsequently, the date not given, that there had been some improvement. A considerable affection at the summit of each lung.

Case 15. M. J. W., aged 25, tailor, admitted (Buffalo) July, 1855. Cough for more than two years. Profuse hæmoptysis in December, 1853. Kept the bed three months in winter of 1853–54; not since, but unable to work, gained a little in weight during the past winter, but lost what he had gained during the summer. Not greatly emaciated. No night sweating. Able to be up and out of doors. Had taken cod-liver oil steadily for eighteen months. Crossed the ocean in summer of 1854, spending three months in Dublin, and thought he was benefited by the voyages. The signs denoted an affection of summit of each lung, the left lung being most affected. There is no further record of the case.

Case 16. Robert E., aged 25, laborer, was admitted (Louisville) in October, 1854. Cough for eight months. The signs and symptoms on his admission were not noted. A year afterward, when my service began, there was a considerable affection, with cavernous signs, at the summit of the right lung. He was thirty-four pounds under his weight of health. The appetite and digestion were good. No night sweating. The expectoration was not abundant. Able to be up and about. In addition to cod-liver oil, he had taken some wood naphtha, and alcoholics moderately. He remained the same at the date of the last record, February 8th, 1855.

Case 17. John R., aged 35, laborer, was admitted (Louisville) in October, 1855. Cough for four or five months. On admission the signs showed considerable solidification at the summit of the left lung. He had kept the bed for three weeks and had febrile movement with considerable expectoration. He was quite feeble and had lost considerably in weight. The appetite was poor. In a short time after his admission, the solidification at the summit of the left lung notably diminished, and there was marked improvement in local and general symptoms, showing that there had been an intercurrent pneumonia. At the date of the last record, February 8th, 1856, he had gained five pounds in weight. He was able to be up and about. The physical signs showed an affection at the summit of each lung. He had taken the oil up to a short time before this date, when it had been relinquished on account of its impairing appetite. He took also tonic remedies.

Case 18. George M., aged 30, tailor, was admitted (Louisville) in November, 1855. Cough for a year, but he had kept at work until two weeks before his admission. Entered with quotidian paroxysms of fever which were promptly arrested by quinia. An affection at the summit of each lung, with signs of cavities. Noted, January 27, 1856, that he had improved, the cough and expectoration much diminished, his appetite good, and he had increased in weight. I noted, February 8th, that he was acting as an assistant to the ward nurse.

Case 19. Charles H., aged 66, laborer, admitted (Louisville) November, 1855. Cough for five weeks. Hæmoptysis after admission. Abundant expectoration. A considerable affection at the summit of the right, and a small affection of the summit of the left, lung. Noted, February 8, 1856, that he had improved. Cough and expectoration diminished, and weight increased.

Case 20. Mrs. K., aged 34, domestic, admitted (Louisville) January 31, 1856. Cough for twelve weeks. No treatment prior to admission. She had lost considerably in weight, and had not been able to work since the commencement of the cough. Appetite poor. A large affection, with cavernous signs, at the summit of the right lung. It is noted, February 15th, that she was improving. No further record of the case.

Case 21. Bryant D., aged 30, laborer, admitted (Buffalo) December 6, 1856. Cough had existed from December, 1854, to May, 1855, and he was free from cough, being otherwise well, from May, 1855, to February, 1856. Cough had continued since the latter date. He had kept at work for the most part up to a few days before his admission. He would be able, as he thought, now to work except for the want of breath on exercise. His aspect was not morbid. His appetite was excellent. A considerable affection at the summit of the left lung. On the 8th day after admission he left the hospital feeling able to work. He was admitted again in October, 1857. He had kept at work since his discharge. He had lost considerably in weight. His expectoration was abundant. He had night sweating. The voice was hoarse, and had been so for some months. The fingers and toes were bulbous. A large affection, with cavernous signs at the summit of the left lung. Noted, May 13th, 1858, that there had been progressive improvement. Aspect notably better. Gain in strength and apparently in weight. Night sweating occasionally. September 30th, noted that the improvement continued to be progressive. There was improvement in the voice. My service ended on this date. Resuming my service March 1, 1859, found this patient still in hospital. Had kept the ward for the preceding four months. The cough and expectoration were less than in September last. The cod-liver oil had been continued, with alcoholics moderately. He had become at length disgusted with the oil, and the appetite was now poor. At the date of the last record, April 12, 1859, noted that he had failed and was now quite feeble.

Case 22. John R., aged 17, laborer, admitted (Buffalo) November 2, 1856. Two years before date of admission he had intermittent fever, and during five months there were frequent relapses. During this time he had cough and several attacks of hæmoptysis. Had had pain in back for a year, progressively increasing. Now cough slight and appetite good. There was angular projection of spine at the second lumbar vertebra, with an abrupt lateral curvature. Pain referred to the side of the curvature on exercise, and much tenderness on pressure. A small affection at the summit of the right lung. Left hospital April 27, 1857, his general condition improved and free from cough. He was readmitted in May, 1858, and treated with the hypophosphites. (*Vide* Case No. 4 in the list of cases treated with the latter.)

Case 23. Edward H., aged 55, laborer, admitted (Buffalo) February, 1857. Six years prior to this date he had cough and expectoration, and two months after these symptoms began, hæmoptysis. The following spring the cough and expectoration ceased. He kept steadily at work. The cough and expectoration returned during the first winter, and persisted. Now, his aspect was morbid. He was somewhat emaciated. He had night sweating. The appetite was good. There was flattening at the summit of the chest on the right side, with diminished respiratory movements, dulness on percussion, broncho-vesicular respiration, and increase of vocal resonance. In May, 1857, when my services ended, his condition was unimproved. In October, when I resumed service, the patient was still in hospital. He had kept the bed a part of the time, and constantly for the preceding three weeks. He had progressively declined, and the signs showed progress of the pulmonary affection. In February, 1858, his condition was improved. He was able to be up and dressed. His appetite continued. This improvement took place after the oil had been suspended, while he was taking only a cough palliative and alcoholics moderately.

Case 24. Michael K., aged 35, laborer, admitted (Buffalo) in April, 1858. Cough since January, 1857. He had continued to work up to August, 1857. He had lost twenty pounds in weight. For three or four months habitual night sweating. For the past four weeks daily recurring febrile paroxysms with pronounced chill. His aspect was not notably morbid, and he was able to be up and out of doors. The appetite was poor. A large affection at the summit of the left lung, with cavernous signs. Noted May 18th that there was marked improvement; the cough and expectoration much diminished; the aspect improved; the appetite good, and he was able to be out of doors most of the time. In addition to the oil alcoholics were given moderately, and for a few days before he left the hospital the hyposulphites were substituted for the oil. He left May 24, 1858, declaring that he was able to go to work.

Case 25. Wm. W., aged 26, laborer, admitted (New Orleans) in January, 1859. Cough for a year. Hæmoptysis repeatedly. He had lost fifty pounds in weight, being one-third of his weight in health. Had been unable to work for ten months, on account of weakness and want of breath. For the two past weeks tertian paroxysms of fever with profuse sweating. He presented an emaciated appearance, with circumscribed flush on cheeks, and some lividity of prolabia. A large affection at the summit of the right lung. February 12, 1859, I noted improvement. He was now up and dressed all day. The expectoration was diminished by one-fourth. The appetite was good. February 23d, the house physician reported to me by letter that the improvement continued. In addition to the oil, alcoholics were given moderately.

Case 26. Michael D., aged 43, laborer, admitted in December, 1859 (New Orleans). Cough for a month. Profuse hæmoptysis shortly after admission. A small affection at the summit of the right lung. There was an aortic direct, and a mitral regurgitant cardiac murmur, with some enlargement of the heart. Noted March 11, 1860, that he had improved in strength and appearance, and that the cough and expectoration had diminished. March 26th, he reported well enough to do light work and was discharged. In addition to the oil, alcoholics were given moderately.

Case 27. Godleb K., aged 42, butcher, admitted (New Orleans) in December, 1860. Cough for thirteen months. In July, 1860, profuse hæmoptysis, and frequent recurrences afterward. Had kept the bed nearly all the time from October, 1859, to June, 1860, on account, as he stated, of weakness. Shortly after he began to cough he had pain in the chest, for which he got, in succession, twenty-four blisters. When admitted he wished to keep the bed, but he was required to be up. Aspect not notably morbid. Appetite good. A moderate affection at the summit of the right lung. No signs of present or past pleurisy. This patient took the chlorate of potassa from his admission to January 28, 1861. This remedy was then discontinued, and the cod-liver oil substituted. Up to the change in treatment there had been no improvement. Improvement began after the change was made, and was progressive. Noted February 28th that he was discharging the duties of a ward nurse.

Case 28. William L., aged 47, lamplighter, admitted (Bellevue) in November, 1866. Father, mother, three brothers, and, a sister (these with himself constituting the whole family) had died with phthisis. Stated on admission that he had been ill only seven weeks. There was depression at the summit of the chest on the right side, with diminished respiratory movements, marked dulness on percussion, cavernous and bronchial respiration, and bronchophony. The lower limbs were œdematous. The urine was not albuminous and contained no casts. In February, 1867, noted that the improvement was very good. His aspect was comparatively healthy, and he had gained in weight. The cough and expectoration were slight. In addition to cod-liver oil, tonics had been given and alcoholics moderately.

Case 29. B., gasfitter, age not noted, admitted (Bellevue) September, 1870. Cough for two years. It was preceded by hæmoptysis, and he had had nineteen recurrences, generally the hemorrhage being profuse. He was anæmic on his admission, and somewhat emaciated. Occasional night sweating. A moderate affection at the summit of the right lung. November 1, 1870, noted that the improvement was marked. He left the hospital on this date, and I subsequently learned that the improvement had been progressive, and that he had returned to his business. In addition to the cod-liver oil, chalybeate tonics were given.

Of the foregoing 29 cases, 19 were recorded in the hospital of the Sisters of Charity in Buffalo, N. Y., 5 in the Louisville

Marine Hospital, 3 in the Charity Hospital at New Orleans, and 2 in Bellevue Hospital. In a certain proportion of the cases, the treatment embraced, in addition to the cod-liver oil, tonic remedies, alcoholics moderately, and palliatives for cough or other symptoms. The quantity of oil given was uniform, namely, half an ounce three times daily. The amount of the pulmonary affection, the stage of its progress, its duration, the general condition, etc., varied much, as may be seen by reference to the synopsis of the cases. There is also much variation as regards the duration of the treatment. These circumstances are, of course, important in their bearing on the inquiry concerning the usefulness, or otherwise, of the treatment. Reviewing the facts, irrespective of these circumstances, of the 29 cases, in 12 much improvement took place while the patients were taking the oil; in 8 cases, there was more or less improvement, but less marked than in the preceding 12 cases; in one case the disease had been well tolerated for a long time, under the use of the oil, before admission into hospital, the subsequent history not having been noted, and in 8 cases there was no improvement. Of the cases in which there was no improvement, in one the disease was advanced, and the patient was only two weeks in hospital (No. 2), and in another case (No. 3), the treatment noted was only for two weeks. In one case (No. 23) there was no improvement while the oil was given, but improvement took place after it was suspended.

If the facts in these cases be compared with those obtained by a reviewal of the cases in private practice which were treated with cod-liver oil, the latter show a better result. The contrast, which, however, is not very great, may, perhaps, be accounted for by the absence, in the hospital cases, of the hygienic measures which entered into the treatment of a part of the cases in private practice, and by the better character of the latter cases. The four hospitals in which the hospital cases were observed are pauper institutions, and it is fair to conclude that the patients were not as favorable subjects for improvement as the patients in private practice.

In 20 out of 29 of the hospital cases, there was more or less improvement under the treatment with the cod-liver oil. Now, how much of this improvement is to be attributed to the oil? Would the same amount of improvement, in the same number of the cases, have taken place, if no oil had been given? It is true that the analysis of 40 cases, without medicinal treatment (18 without and 22 with hygienic measures) gave better results than the analysis of these 29 cases. The probable explanation of this has been already stated, namely, inasmuch as medicinal treatment in the 18 and 22 cases was not withheld with a view to experimental observation, the presumption is that most of these cases gave evidence of an intrinsic tendency to a favorable course, and for this reason, cod-liver oil, or other remedies, were not given. The above questions cannot be answered by an appeal to facts; I will only say, to my mind it is rationally probable that the oil was to a certain extent useful, but there is certainly no proof of its exerting a potentially curative influence in these or in other cases which have been studied.

In these, as in other cases, we have that factor of indeterminable power, namely, the intrinsic tendency of the disease, either to progress or to become non-progressive. With regard to hygienic circumstances, it may seem that, in these hospital cases, these were not favorable, as compared with the hygienic measures of treatment which entered more or less into the treatment of cases in other groups. This is undoubtedly true; but an important consideration here has reference to the relative circumstances of the hospital patients prior to, and after, their admission. The patients were mostly from the poorest classes of society. Prior to admission into hospital, they were subject to the vicissitudes incident to their station in life—hard work, exposure, poor food, ill-ventilated and overcrowded rooms at night, the hardships, often, of intemperance, etc. On admission into hospital, these unfavorable hygienic conditions were exchanged for comfortable quarters, a good diet, rest, freedom from anxiety, and temperate habits. Thus, relatively considered, a hospital offers, perhaps, as much advantage to many patients as travelling or change of climate to private patients in the higher walks of life. This, in part at least, affords an explanation of the improvement which often takes place in cases of phthisis and other chronic affections treated in hospitals. I have cited cases of phthisis in which notable improvement took place in hospital with no medicinal treatment. Many such cases, not embraced in my records, have come under my observation at Bellevue Hospital, and I have often presented them at my hospital clinics. Were it logical to base conclusions on a certain number of selected cases, it would not be difficult to collect evidence showing that a large pauper hospital, like Bellevue, combines the circumstances most favorable for the arrest of phthisis. This would not be more illogical than to infer from a certain number of selected cases that a curative influence is exerted by a particular remedy or hygienic measure.

Cases treated with the Hypophosphites.

The number of cases treated with the hypophosphites is not large. I shall introduce a succinct account of each of the cases.

Case 1. Mr. R., aged 35, merchant, residing in Western New York, consulted me in September, 1857. Cough for from two to three months. Moderate expectoration. Hoarseness. Had lost ten pounds in weight in three months. Aspect not morbid. Had continued in his business. Appetite and digestion good. Of late, night sweating. A considerable affection at the summit of the right lung. He consulted me again in September, 1858. He had meanwhile not lost in weight. Aspect not morbid. Appetite and digestion good. He took for a short time after the first consultation cod-liver oil, and then substituted for it the hypophosphite of soda and lime, the dose not noted. He had taken alcoholics in very small quantity, and he had been more out of doors than previously. He again consulted me in May, 1859. He had lost only two pounds in weight since the preceding consultation, and his aspect still was not morbid. His appetite and digestion were fair. He had continued steadily in his business.

Case 2. Dr. D., of Carrolton, La., aged 46, consulted me at New Orleans, in December, 1858. Cough had existed for eighteen years. In 1853, he had profuse hæmoptysis, and again in 1854. For a year after the latter date, the cough and expectoration were much less than previously. He considered himself in fair health, and attended to practice. For the past two years the cough and expectoration had been variable; but he had kept about, frequently travelling, and, when at home, engaging in practice. The appetite and digestion were generally good. He was thirty pounds under his weight of health, and his aspect was morbid. A large affection at the summit of the right lung, with cavernous signs, and much depression of the walls of the chest in this situation. During the existence of the disease he had taken very little medicine. He had taken the hypophosphite of lime of late, and, as he thought, with benefit. He had formerly taken alcoholics moderately, but had discontinued them for the past year.

This case is a good example of slowly progressive phthisis.

Case 3. In the case of Dr. E. P., which is No. 3 in the list of cases receiving no medicinal treatment (*vide* page 337), the disease was slowly progressive for five months. At the end of five months he took the hypophosphite of soda, and alcoholics moderately. During the next four months the disease progressed more rapidly than before, the record of the case ceasing at the end of the four months.

Case 4. In the case of John R., No. 22 in the list of cases treated with the cod-liver oil (*vide* page 365), this remedy was given on his admission into hospital in November, 1856, and continued until his discharge in April, 1857. There was angular curvature of the spine in this case. His general condition was improved at the time of his discharge, and he was free from cough. He was readmitted in May, 1858. He had lost in weight and strength since his discharge, and the spinal curvature had increased. The appetite and digestion were good. The cod-liver oil was given for a short time after his readmission, and he was then placed under treatment with the compound syrup of the hypophosphites. Four months after the date of his readmission, it was noted that the angular curvature had increased, but that he was up all day and out of doors. My service ended at that time, and there is no further record of the case.

Case 5. Jean F., aged 22, laborer, admitted (New Orleans) in December, 1858. Cough for three months. Hæmoptysis, profuse, occurred soon after the commencement of cough. Appetite good. A considerable affection at the summit of the right lung. The hypophosphite of soda was prescribed in dose of a scruple three times daily. January 2d, 1859, noted that the patient had been confined to bed with pain in the chest, rusty expectoration, and signs denoting pneumonia affecting the upper lobe of the right lung. He was, however, now up, dressed and about the ward. Shortly after this date he had hæmoptysis. The hypophosphite of soda was continued. He had occasional night sweating. January 29th, he was discharged in order that he might return to his native country, France. February 1st, 1859, readmitted. There were cavernous signs at the summit of the chest on the right side, and he was evidently failing. The hypophosphite of soda was continued. Under date of March 6th, after my term of service had ended, the house physician informed me by letter that this patient remained about the same.

Case 6. Louis N., aged 25, silk workman, admitted (New Orleans) December 11, 1858. Cough for nine months. He had recently arrived from France. He had lost forty-five pounds in weight in the preceding six months. A month before admission a perineal abscess had occurred, which had resulted in fistula. He had anorexia. A small affection at the summit of the left lung. A scruple, three times daily, of the hypophosphite of soda was prescribed. He was discharged December 22d, at his request, and readmitted on the 1st of January, 1859. The hypophosphite of soda was again prescribed. January 27th, he complained of vomiting, and bismuth was substituted for the hypophosphite of soda. The signs now showed cavity at summit of the left lung. March 6th, the house physician reported by letter that the patient was rapidly declining.

Case 7. Bryan C., aged 20, gardener, admitted (New Orleans) December 20, 1858. Cough for two years. Hæmoptysis had occurred repeatedly, and sometimes had been profuse. He had lost thirty pounds in weight. He had worked up to two months before admission, and was obliged to quit work on account of want of breath on exercise and general debility. A considerable affection at the summit of the right lung. The voice was husky. This patient was attacked in hospital with acute pneumonia affecting the lower lobe of the left lung. He recovered from this affection, and in the latter part of January, 1859, thought he was well enough to leave the hospital. He was discharged but speedily returned. February 12th, it is noted that cavernous signs existed at the summit of the right lung. He was treated with the hypophosphite of soda, a scruple three times daily, and he also took some cod-liver oil. March 6th, the house physician reported by letter that he had progressively improved as regards his general condition.

Case 8. Benjamin D., aged 35, boatman, admitted (New Orleans) January 11, 1859. Cough for two months. Hæmoptysis prior to, and shortly after, his admission. He was twenty pounds under his healthy weight. The appetite and digestion were good. A considerable affection at the summit of the left lung. The hypophosphite of soda was prescribed in dose of a scruple three times daily. It is noted February 2, 1859, that there was in this case distinct improvement. The aspect was better. The expectoration was less. The patient on this date was discharged at his request.[1]

Case 10. William J., aged 26, seaman and laborer, admitted (New Orleans) February, 1860. In December, 1858, he was wrecked on the coast of Florida, and was four days clinging to the vessel, constantly wet, and having nothing to eat or drink. He lost his voice, and did not regain it for seven weeks. Soon afterward his cough began, and it had continued up to his admission. Had diarrhœa for four months after having been wrecked. He had since been subject to attacks of intermittent fever which he had never had previously. Never confined to the bed, and most of the time he had been able to work. He had had hæmoptysis three times, twice profusely. He was thirty pounds under his healthy weight. The appetite and digestion were good. His stomach did not tolerate the cod-liver oil, and the hypophosphite of soda was substituted (a scruple three times daily). It is noted March 11, 1860, that there had been progressive improvement. He had gained in weight, and now felt able to return to work. There was an evident increase in weight. A moderate affection at the summit of the left lung.

Of the foregoing ten cases, in three there was no improvement under the use of the remedy; in three the disease was progressive, and in four there was improvement more or less marked. These facts do not speak loudly in behalf of the curative power of the hypophosphites. But it is to be considered, first, that the cases are few in number. In the second place, the remedy was given in too large doses in most of the cases, according to the views of Churchill, in his late work.[1] Third, I cannot vouch for the purity of the hypophosphite of soda, which was the salt generally given. In two of the cases acute lobar pneumonia occurred while the patients were under treatment with the hypophosphite of soda, and there may be room for the suspicion that the remedy may have contributed to this intercurrent affection. The cases, however, were observed in New Orleans, where pneumonia occurs much more frequently than at the North. Of the ten cases, in all save the first two, the patients were in hospital, and, of the eight hospital cases, six were in the Charity Hospital, New Orleans. The hygienic conditions in all of these six cases were, therefore, the same.

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[1] Case No. 9 was inadvertently omitted, and the omission was ascertained too late for the case to be introduced. In the omitted case there was no improvement under the use of the remedy.

Cases treated with Alcoholics.

Under this heading I embrace a few cases in which alcoholics were given in a considerable or large quantity, with a view to a curative influence.

Case 1. This case is No. 2 in the series of cases receiving neither medicinal nor hygienic treatment. (*Vide* page 337.) The patient had continued to work as a farmer, and had improved in local symptoms as well as in weight and strength. July 1, 1858, cod-liver oil and whiskey were advised. The oil was taken for a short time only on account of its not being tolerated by the stomach. He took half a pint of whiskey daily for about two months, and then substituted beer, which he took very freely. Meanwhile he had hæmoptysis repeatedly and profusely. September 22, 1858, the date of the last record, I noted that he had improved steadily up to a month before this date. After this, and following a profuse hæmoptysis, he had failed, and the physical signs showed a considerable increase of the pulmonary affection.

Case 2. Mrs. W., aged 41, consulted me, at New Orleans, in March, 1861. Cough for nearly a year. She was twenty pounds under weight of health, but she had recently gained in weight. Appetite variable, but recently good. Had had night sweating, but not of late. A moderate affection at the summit of the right lung. She had tried the cod-liver oil, but the stomach did not tolerate it. For the preceding month she had taken brandy and molasses at the rate of a gallon of each per week. She had decidedly improved under this treatment. She had taken in addition the "balsam of tar," for cough. She was on her way to Western Texas.

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[1] Consumption and the Hyphophosphites. London, 1875. By John Francis Churchill, M.D.

Case 3. J. W. H., aged 32, telegraphist, consulted me at New York, in November, 1867. He had signs and symptoms showing a tuberculous affection, but I made no record of the case at that time. He was quite feeble, and his weight was only ninety-six pounds. He took the hypophosphites, the cod-liver oil, and whiskey, the latter freely, at the rate of a gallon in two weeks. He soon began to improve, and the improvement was such that he did not leave his business and seek another climate, as I had advised him to do. He gained from twenty to thirty pounds in weight, and the pulmonary symptoms became slight. He remained quite well through the winter and spring, but he began to decline in the hot weather of summer, continuing steadily in his business, which kept him constantly within doors. He consulted me again in November, 1868. His cough had recently increased, and the signs now showed cavity at the summit of the left lung. He had for some time discontinued the whiskey and oil. He was advised to return to them. He subsequently died, but the date of his death, and other details, are not noted.

Case 4. Ch. H. H., aged 33, of Memphis, Tennessee, consulted me in September, 1868. Cough for three years. Huskiness of voice. Had never had syphilis. Had crossed the Atlantic repeatedly, and always with benefit. Had passed some time in Minnesota. He was now up to his healthy standard in weight and strength. A tuberculous affection with cavernous signs at the summit of the left lung. He had had no medicinal treatment for the preceding year, but had taken half a pint of brandy daily.

Here was an old stationary affection, with innocuous cavities, complicated with chronic laryngitis, the general health good.

Case 5. Mrs. V., of New York, aged 50, consulted me in May, 1870. Cough for a year and nine months. Under the care of a homœopathic practitioner during the first six months. For the six months preceding the consultation with me her voice had been extinct from chronic laryngitis. During this period she had been treated with hypophosphites, cod-liver oil, and alcoholics, together with out-of-door life. She had improved progressively. Her weight now was greater than ever in her life before, and her aspect was healthy. She was taking half a pint of whiskey daily. The menses, which had been suspended during the previous winter, had returned, and occurred now regularly. A considerable affection, with cavernous signs at the summit of the right lung.

These five cases were all in private practice. In two of the cases the hypophosphites and cod-liver oil were given in addition to the alcoholic treatment. In all the cases, save case No. 1, there was notable improvement during the time that alcoholics either entered into or constituted the treatment; and in Case No. 1 there was progressive improvement up to the occurrence of an attack of profuse hæmoptysis.

I subjoin the following case by way of illustration of the treatment of a case of phthisis over thirty years ago:—

Levi B., admitted into the Erie County Poor-House in April, 1843. Cough for eight months. It was now considerable, with an abundant expectoration. There had been night sweating, but it had now ceased. A considerable affection at the summit of the left lung. Three weeks after his admission it was noted that he had much improved, being now able to walk two miles. He had been treated with counter-irritation by the tartar emetic ointment and Dover's powder. I appended to my record of the case the following remarks: "This case furnishes a good example of what may be done toward preventing the progress of tubercular disease. The treatment for the present will be, keeping the system mildly under the influence of opium, and increasing the pustulation over the left side of the chest by means of the tartar emetic ointment. As the weather becomes warm, exercise, with moderation, in the open air, will be recommended."

At that time nothing was accorded to an intrinsic tendency of phthisis to become non-progressive and retrogressive.

The following case is the only one in this collection in which the pancreatic emulsion was employed.

Mr. L., aged 23, was visited by me in May, 1870. Cough had existed for a year. The preceding winter and summer had been passed in Minnesota. The voice had become extinct from chronic laryngitis during the winter. At the time of my visit he was evidently near the end of life. He was extremely feeble, and greatly emaciated. Diarrhœa had been for some time a prominent symptom, and the dejections contained floating fat. The pancreatic emulsion had been given with much benefit as regards the diarrhœa. Death took place shortly after my visit. I noted the case chiefly with reference to the benefit obtained by the pancreatic emulsion.

I shall conclude the analytical study with reference to treatment, by enumerating the cases in which, severally, the different remedies and classes of hygienic measures were employed, under two headings, as follows: 1. Summary of the medicinal treatment; 2. Summary of the hygienic treatment.

Summary of the Medicinal Treatment.

Cod-liver oil entered more or less into the treatment in 84 cases. Of these 84 cases, 6 ended in recovery; in 10 the disease was arrested or non-progressive; in 1 case the disease was very slowly progressive; 23 are among the fatal cases; and in 44 the histories are defective as regards duration or termination.

The hypophosphites entered into the treatment in 16 cases. Of these 16 cases, 2 ended in recovery; in 1 case the disease was arrested or non-progressive; 3 are among the fatal cases; and in 10 the histories are defective as regards duration or termination.

Alcoholics, used, not moderately or sparingly, but freely—that is, from six ounces to a pint of spirit daily—entered into the treatment in 15 cases. Of these 15 cases, 2 ended in recovery; in 3 the disease was arrested or non-progressive; in 2 the disease was slowly progressive; 3 are among the fatal cases; and in 5 the histories are defective as regards duration or termination.

Summary of Hygienic Treatment.

The hygienic measures of treatment may be classified as follows:—

1. Temporary change of climate.
2. Change of habits from those more or less sedentary and confining within doors, to those involving out-of-door life and activity.
3. Change of residence either from the city to the country, or a permanent removal to a different climate.
4. Change of occupation.
5. A long sea voyage or a series of sea voyages.

Now, I propose to enumerate the cases in which these classes of measures entered into the treatment, and to inquire what proportion of the cases ended in recovery, in what proportion was the disease not progressive, what number were slowly progressive, and, of the fatal cases and those either the duration or termination of which was not noted, what apparent influence on the disease was exerted by these measures. The study of the cases from this stand-point may, perhaps, lead to some conclusions respecting the importance of the hygienic treatment of phthisis.

Temporary change of climate.—This was resorted to in a larger number of instances than any of the other measures. It entered into the treatment in 74 cases, the whole number of instances in which the different classes of measures were employed being 159.

Of the 74 cases, in 9 the disease ended in recovery. The facts, reproduced as concisely as possible, in these 9 cases respectively, in respect to the change of climate are as follows:—

1. Giving up the practice of medicine in the country in Western New York, and spending two consecutive winters in Philadelphia.[1] (Case No. 15, page 194.)
2. A winter in Florida and a summer in Minnesota; afterward a voyage to Gibraltar, and out-of-door life on returning home. (Case No. 21, page 197.)
3. A winter in Egypt. (Case No. 42, page 211.)

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[1] The cases in this summary are referred to in order that, if the reader desire to do so, he may readily turn to a fuller account of them.

The foregoing cases had no medicinal treatment with a view to a curative influence.

4. Successive winters in the South. (Case No. 1, page 193.)

5. A sojourn in Europe for from one to two years. (Case No. 17, page 195.)

6. Relinquishing sedentary pursuits and going to Europe. (Case No. 25, page 200.)

7. Went to Minnesota and returned well. (Case No. 28, page 201.)

8. Travelled in Europe and afterward in the Western States. (Case No. 37, page 208.)

9. Went to the mountains in Lima, South America, and returned well. (Case No. 40, page 210.)

Of the foregoing six cases the histories are defective as regards medicinal treatment.

Of the 74 cases, 13 are in the list of those in which the disease was arrested or non-progressive. The facts in these 13 cases are as follows:—

1. Several winters in the West India Islands. (Case No. 15, page 229.)

2. A winter and spring in Nice, and the following summer in the Adirondacks. (Case No. 18, page 230.)

3. The spring months and summer in Europe, and afterward removal of residence from New York to the country in New Jersey. (Case No. 22, page 233.)

4. After travelling in Europe, a winter in Nassau, N. P., and a winter in Aiken, S. C., afterward a voyage around Cape Horn, and removal of residence to California. (Case No. 27, page 235.)

5. A summer in Minnesota, and afterward the winters passed in New York and the summers in the country. (Case No. 30, page 237.)

6. Several months in Europe, prior to, and after which, much out-of-door life. (Case No. 16, page 229.)

7. Four consecutive winters in Aiken, S. C. (Case No. 20, page 232.)

8. Summer in Minnesota. (Case No. 14, page 227.)

9. Two winters in Mentone. (Case No. 28, page 236.)

10. Summer in Vermont. (Case No. 31, page 238.)

11. Went to Mentone. (Case No. 13, page 227.)

12. A winter in Florida, and the summer following at Lake

George. In the autumn went to Minnesota, but, not doing well, left, and passed another winter in Florida. (Case No. 19, page 231.)

13. Two winters in Mentone. (Case No. 25, page 234.)

Of the foregoing 13 cases, there was no medicinal treatment for a curative influence in the first 7. In case No. 8, alcoholics were employed; cases Nos. 9 and 10 were treated with cod-liver oil; case No. 11 was treated with oil and the hypophosphites, and in the remaining two cases the histories are defective as regards medicinal treatment.

Of the 74 cases, 5 are in the list of cases of slowly progressive phthisis. The facts are as follows:—

1. Several months were spent repeatedly in Europe; a winter was passed in Cuba, another in Philadelphia, one in New York (the patient a resident in Boston), and the summers in the country. (Case No. 3, page 244.)

2. Travelling in Europe. (Case No. 4, page 245.)

3. Travelling in Europe, and afterward much out-of-door life. (Case No. 5, page 246.)

4. Went to Europe, having previously improved under habits of out-of-door life. (Case No. 6, page 246.)

5. The spring months in Cuba; the summer in the country. Afterward voyage to California, and travelling in Europe. (Case No. 8, page 249.)

Of the 74 cases, 33 are in the list of fatal cases. The facts in these cases are as follows:—

1. After change of habits of life and improvement, went to Savannah, and notable improvement there for a time. (No. 1, page 302.)

2. Went to Florida, and notable improvement, returning in the summer apparently quite well. (No. 2, page 302.)

3. A young woman, married; went to Florida in the autumn, and died in February. (No. 3, page 303.)

4. Went to Aiken, and returned to Western New York on horseback, apparently well, being stouter than ever in his life before. (No. 5, page 303.)

5. Travelled in the Western States, returning apparently quite well; afterward went to Augusta in the autumn and died in the winter. (No. 6, page 303.)

6. Went to Cuba and different places in the Southern States,

with benefit. Minnesota in the summer, with benefit. Lexington, Ky., in the autumn, with benefit. (No. 7, page 304.)

7. Summer in Minnesota, and improvement. (No. 8, page 304.)

8. Several months in Paris, Nice, and other places in Europe, doing well. Afterward sea voyages. A winter in Minnesota, where he died. (No. 9, page 305.)

9. In Europe several months, with benefit. Summer in Adirondacks, with benefit. Went to California, and died there. (No. 11, page 306.)

10. Winter in Minnesota, with benefit. (No. 12, page 306.)

11. New Orleans in the spring, and improved. Afterward went to Minnesota and died there. (No. 16, page 308.)

12. Went to Rio Janeiro, without benefit, and died soon after his return. (No. 18, page 309.)

13. Passed three winter months at Nassau, N. P., without appreciable benefit. Death took place the following winter.

14. A winter in Mentone, a summer on the Hudson, winter in Aiken, and summer in New Jersey, all apparently beneficial. (No. 19, page 309.)

15. Travelled for four years in Europe and California. Went to Rome, and died there. (No. 21, page 310.)

16. Went from Western New York to New Hampshire, and was much improved. (No. 1, page 313.)

17. Passed a winter in Virginia, the residence having been in Buffalo, N. Y.; much improvement. (No. 2, page 314.)

18. Winter passed in St. Augustine and Jacksonville, Florida, with improvement. (No. 3, page 314.)

19. Went from Buffalo to Michigan, and was much improved. (No. 8, page 316.)

20. Went to Minnesota from Buffalo in the winter, and notable improvement, the patient when starting on the journey very feeble. (No. 10, page 316.)

21. Went to Minnesota, with benefit. (No. 12, page 318.)

22. Went to Minnesota, with benefit. (No. 14, page 319.)

23. Went to Cuba, without benefit, death taking place soon after returning to New York. (No. 15, page 319.)

24. Went to Minnesota, with benefit. (No. 16, page 320.)

25. Went from Massachusetts to Philadelphia, without benefit, in an advanced stage of the disease. (No. 17, page 320.)

26. After change of habits to those of out-of-door life, with improvement, passed the winter and spring in South Carolina, with benefit. (No. 18, page 320.)

27. Went to Savannah, Ga., in the autumn, with benefit. (No. 19, page 321.)

28. The previous history appeared to show arrest of phthisis twice on going to Europe. (Page 324.)

29. After improvement following much out-of-door life, went to Cuba; had pneumonia twice, and returned with an increase of the phthisical affection. (Page 324.)

30. Went to Europe and remained a year and a half, and after his return was much out of doors. Disease slowly progressive for four years. (Page 325.)

31. Went to Cuba, without apparent benefit. (Phœbe D., page 327.)

32. Passed the winter in the South, without benefit, death taking place in the spring. (No. 1, page 329.)

33. Went to New Orleans in the winter, and improved for a time, but afterward declined. (No. 2, page 329.)

Of the 74 cases 14 are in the list of those of uncertain duration or termination. The facts in these 14 cases are as follows:—

1. The patient, residing in Western New York, passed two successive winters in Washington, D. C., the disease being non-progressive. (No. 1, page 346.)

2. Travelled in the Southern States, and the symptoms of the disease almost disappearing; afterward much in the open air, the disease then being progressive. (No. 3, page 346.)

3. The patient, residing in Tennessee, spent the summer in Minnesota, the disease non-progressive. (No. 5, page 347.)

4. The patient, residing in Rhode Island, after improvement following out-of-door life, passed a winter in the west, and declined. (No. 8, page 348.)

5. A winter passed in Minnesota, and notable improvement. (No. 10, page 349.)

6. Travelled in Europe, and passed a winter in Algiers. Disease for four years, and non-progressive. (No. 11, page 349.)

7. Two successive winters were passed in Minnesota, without apparent benefit; afterward notable improvement with out-of-door life in New Jersey. (No. [illegible], page 349.)

8. After having crossed the Atlantic several times, with benefit, the spring months were passed in Minnesota without improvement. (No. 13, page 350.)

9. A winter was passed in Florida, without improvement, the disease, however, making no progress. (No. 15, page 350.)

10. Went to Norfolk, Va., from New York in March, with notable improvement. (No. 16, page 351.)

11. Travelled in Europe, with benefit. (No. 17, page 351.)

12. Eleven weeks passed in New Mexico, with notable improvement. (No. 20, page 353.)

13. A summer passed in Iowa, the disease not progressing. (No. 22, page 353.)

14. Went to the South, and greatly improved.

Reviewing the facts in the foregoing 74 cases with reference to the influence of a temporary change of climate in cases of phthisis, without regard to the particular climate resorted to, the stage of the disease, or other circumstances, it appears that in 9 of the 74 cases the disease ended in recovery; 13 are in the list of cases of arrested or non-progressive phthisis; 5 are in the list of cases in which the disease was slowly progressive; 33 are in the list of fatal cases, and in 14 cases either the duration or termination of the disease does not appear in the histories. It is fair to conclude that the change of climate was more or less useful in all but the fatal cases, and those of uncertain duration or termination; that is, in 27 of the 74 cases. Of the 33 fatal cases, in 23 the histories appear to show more or less benefit from the changes of climate; in one case the disease did not progress; in one case it progressed slowly, and in 8 cases there was apparently no benefit. Of the 14 cases of uncertain duration or termination, in 6 the histories appear to show benefit; in 5 the disease did not make progress, and in 3 there was apparently no benefit. Thus of the 74 cases, there was apparently more or less benefit from the change of climate in 56, and in only 11 does it appear that there was no benefit, the disease either making no progress or progressing slowly in the remaining 7 cases.

Looking at the subject from the standpoint afforded by this reviewal, it is evident that a temporary change of climate in a large proportion of cases has a favorable influence on chronic phthisis. The facts reviewed render this conclusion positive.

We have now to inquire as to the influence of particular climates over others. As will be seen at a glance, the climatic changes in the 74 cases were varied. It is noted in 17 cases simply that the patients went to Europe, or travelled in Europe, the places of sojourn or travel not being specified. In these 17 cases, were 2 recoveries, 3 are in the list of cases in which the disease was non-progressive, and 5 in the list of cases of slowly progressive phthisis. A favorable influence may be argued in these 10 cases. 5 of the 17 cases are in the list of those proving fatal. Of these 5 fatal cases, in one case the disease was temporarily arrested, in one there was improvement, in one the disease did not progress, and in two cases the disease progressed slowly. Hence, in none of these cases was there other than a favorable influence. 2 of the 17 cases are in the list of those of uncertain duration or termination, and in one of these 2 cases there was improvement, and in the other case the disease did not progress. In none of the 17 cases, therefore, is there ground to infer an unfavorable influence of travelling or sojourning in Europe. Going to Europe involves, of course, sea voyages. If these are made in steamers, the time passed at sea is, however, short, and I shall consider the apparent influence of sea voyages under a separate head.

In one case a winter was passed at Nice; this case is in the list of cases in which the disease was arrested or non-progressive.

In one case a winter was passed in Algiers, the disease remaining non-progressive.

In four cases it is simply noted that the patients went South, that is, from a northern to a southern State.

One of these cases is in the list of those ending in recovery. One is in the list of fatal cases, and the patient was not benefited. Two are in the list of cases of uncertain duration or termination, and in both these cases there was much improvement.

In six cases it is noted that the patients went to Florida. One of these cases is in the list of cases which recovered. One is in the list of cases in which the disease was arrested or non-progressive. 3 are in the list of fatal cases, in 2 improvement taking place, and in one the disease ending fatally there. One is in the list of cases of uncertain duration or termination, the disease, in this case, making no progress.

In seventeen cases the patients went to Minnesota. Two of these cases are in the list of those which recovered. Two cases are in the list of those in which the disease was arrested or non-progressive, but in one of these cases the patient remained there but a short time, going thence to Florida. Nine are among the fatal cases, in seven of which there was improvement, in the other two cases the patients dying there. Four cases are among those of uncertain duration or termination. In one of these cases there was notable improvement; in one the disease did not progress, and in two cases it is noted that there was no improvement.

In four cases, the patients either travelled or sojourned for a time in the West, the place or places not specified save in one case (Iowa). One of these cases is in the list of those ending in recovery. One is in the list of fatal cases, but there was notable improvement. Two cases are among those of uncertain duration or termination, in one case the patient declining, and in the other the disease not progressing.

In three cases the patients went to Aiken, South Carolina. One of these cases is in the list of those in which the disease was not progressive; the remaining two cases are in the list of those ending fatally, but there was notable improvement in both.

In four cases the patients went to Mentone. Three of these are in the list of cases in which the disease was arrested or non-progressive. One case is in the list of fatal cases, but there was improvement in this case.

In six cases the patients went to Cuba. Two of these cases are in the list of those in which the disease was slowly progressive. The three remaining cases are in the list of those ending fatally, and in neither of these cases was there improvement.

In two cases the patients went to California. Both are in the list of fatal cases; one patient dying there, the disease in the other case either not progressing or progressing slowly. I may add, that under the heading, permanent change of residence, are two cases, in which the removal was to Southern California, and in both there was improvement.

In two cases the patients went to New Orleans. Both are in the list of fatal cases. In one case the patient returned improved, and in the other case there was, for a time, notable improvement.

In two cases the patients went to the Adirondacks in the summer season. One of these cases is in the list of those in which the disease was non-progressive; the other is in the list of fatal cases, but there was improvement.

In two cases the patients went to Savannah, Ga. Both are in the list of fatal cases, but in both there was improvement.

In three cases the patients went to Philadelphia in the winter and spring months, one from Massachusetts, and two from the State of New York. One case is in the list of the cases which recovered, and one in the list of cases in which the disease was slowly progressive. The other is in the list of fatal cases, and there was no improvement.

In two cases the patients went to Virginia, one patient residing in Buffalo, N. Y., and the other in New York City. The first of these two cases is in the list of fatal cases, but there was notable improvement. The other case is in the list of uncertain duration or termination, and in this case improvement was marked.

In two cases the patients went to Nassau, N. P. Both cases are in the list of those in which the disease was arrested or non-progressive.

Each of the following climates is represented by a single case, as follows:—

Egypt, the case in the list of those which recovered.

Lima, South America, the case in the list of those which recovered.

Rio Janeiro, the case in the list of fatal cases, and no improvement.

West Indies, the case in the list of those in which the disease was arrested or non-progressive.

Vermont, in the summer season, the case in the list of those in which the disease was arrested or non-progressive.

New York City, the patient from Massachusetts, the case in the list of those in which the disease was slowly progressive, death taking place in New York.

Augusta, Ga., the case in the list of fatal cases, and the patient dying there.

Lexington, Ky., the case in the list of fatal cases, but improvement taking place.

South Carolina, the case in the list of fatal cases, but improvement taking place.

New Hampshire, in winter, the patient residing in Western New York, the case in the list of fatal cases, but much improvement.

Michigan, the patient residing in Buffalo, N. Y., the case in the list of fatal cases, but much improvement.

Washington, D. C., in the winter, the patient residing in Western New York, the case in the list of cases of uncertain duration or termination, the disease not progressing.

New Mexico, the case in the list of cases of uncertain duration or termination, notable improvement taking place.

These facts are not reproduced with a view to the question as to the relative advantages of different climates. As bearing on this question, further details, relating to the season of the year, the stage of the disease, the general condition of the patients, etc., would be requisite. Moreover, the cases representing different climates are too few for such a comparison. An important conclusion, however, is to be drawn from the facts just reproduced, namely, a favorable influence on phthisis is exerted by a variety of climates. It would seem, indeed, judging from these facts, that the favorable influence pertains to the change, rather than to the particular climate chosen. If this be true, it follows that the agencies by which a favorable influence is exerted, relate to accessory or incidental circumstances more than to purely climatic conditions. The study of the apparent influence of changes in habits of life, to which attention will next be directed, will perhaps tend to corroborate this view.

Change of Habits from those more or less sedentary and confining within doors, to those involving out-of-door life and activity.

Hygienic measures belonging to this class entered into the treatment of 44 cases. Of these 44 cases, 11 are in the list of cases ending in recovery. The change of habits made in each of the 11 cases have been already stated.[1]

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[1] *Vide* Cases No. 1, 5, 6, 9, 10, 12, and 13 of cases without medicinal treatment, page 379; Cases No. 4, 7, and 8 of those in which cod-liver oil, hypophos-

Of the 44 cases, 7 are in the list of cases in which the disease was arrested or non-progressive. The facts in these cases are given. (*Vide* page 284.)[1]

Of the 44 cases, 3 are in the list of cases of slowly progressive phthisis (Nos. 1, 5, and 6, page 291).

As will be seen by reference to the cases designated in each of the foregoing three divisions, in some of them other hygienic measures also entered into the treatment. In one case the patient passed several months in Europe; in one case the patient passed a summer in Minnesota; in one case the patient made several voyages to Europe; and in another case the patient travelled in Europe. With the exception of these four cases, the hygienic treatment in all consisted chiefly or exclusively of the measures under present consideration. How much influence is to be attributed to these measures, in these cases, in producing recovery, arrest of the disease, or its slowness of progress, cannot be determined. According, however, a full share of influence to an intrinsic tendency, to the medicinal treatment in those cases in which remedies were employed, and to the other hygienic measures in the four cases just referred to, it seems fair to claim, in behalf of the change of habits, a certain amount of usefulness. In endeavoring to form some estimate of this amount, we may be aided by the study of the fatal cases, and those of uncertain duration or termination.

Of the 44 cases, 8 are in the list of fatal cases. This small number has perhaps some significance. Of these 8 cases, 5 are in the group of fatal cases which received no medicinal treatment. In each of these 5 cases notable benefit was apparently attributable to change of habits.[2] The 3 remaining cases were treated with cod-liver oil. In 2 of these 3 cases the apparent benefit was marked, and in 1 there was for several months no evidence of progress of the disease.[3]

Of the 44 cases, 15 are in the list of those of uncertain duration or termination. In 9 of these 15 cases there was no me-

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phites, and alcoholics were employed, pages 281 and 282; and Case No. 9 of the cases in which the histories are defective as regards medicinal treatment, page 283.

[1] The cases are of those receiving no medicinal treatment, Nos. 6 and 8, page 286; of the cases treated medicinally, Nos. 1, 3, 4, 6, and 7, page 288.

[2] These five cases are Nos. 8, 9, 10, 19, and 20, pages 304 et seq.

[3] These three cases are Nos. 5, 8, and 18, pages 314 et seq.

dicinal treatment. In 6 of the 9 cases, the change of habits was followed by notable improvement. Of the remaining 3 cases the disease was non-progressive for a year or more in 2, and had been nearly stationary for eight years in the remaining case.[1]

In 6 of the cases there was medicinal treatment, namely, cod-liver oil in 4, and the hypophosphites in the remaining 2 cases. In 4 of the 6 cases there was notable improvement; in 1 case the disease was non-progressive; and in the remaining case the disease had existed for eighteen years.[2]

The facts contained in the histories of 22 cases in which either the disease proved fatal, or it was of uncertain termination or duration, show in the great majority improvement, more or less marked, following a change of habits; and in all the other cases it is fair to infer a favorable influence in arresting, for a time, or retarding the progress of the disease. Have we not herein a good ground for attributing not an inconsiderable amount of influence in those cases included in the list of recoveries, of arrested or non-progressive, and of slowly-progressive phthisis? Looking further from the standpoint afforded by the summary of facts in the 44 cases, are we not warranted in saying that the measures of hygiene embraced under this heading are of primary importance in the treatment of phthisis? In giving to this question an affirmative answer, I do not forget that, in the course of these clinical studies, cases of this disease have been shown to end in recovery, to become non-progressive, or to progress very slowly, and to manifest notable temporary improvement, without any material change in the habits of life. Assuming that the measures embraced under this head do exert a potential influence, is it not probable that herein consists not a little of the agency of a temporary change of climate in the cases in which that measure is followed by benefit? A change of climate generally involves change of habits. If the change be from a cold and variable climate to one mild and equable, the patient is able, and is naturally led to live more out of doors than if the change had not been made. The belief or hope of benefit from a climatic influence is an inducement, in the minds of patients, to be as much as practicable in the open air, when the change is to a cold, as well as to a mild climate. Hence is secured a change in habits which, perhaps, has an influence vastly greater than any special climatic agency, and which, could it have been secured to the same extent, might have proved equally beneficial without any change of climate.

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[1] These nine cases are Nos. 2, 4, 6, 7, 8, 14, 18, 19, and 21, pages 346 et seq.

[2] These six cases are Nos. 2, 3, 4, and 11 of the cases treated with cod-liver oil, pages 355 et seq.; and Nos. 1 and 2 of cases treated with hypophosphites, page 370.

Change of residence either from the city to the country, or to a different climate.

In 13 cases there was a permanent change of residence. Other hygienic measures, namely, change of habits or sea voyages, entered also into the treatment of some of these cases, so that they are embraced in other of the classes in this summary. As the cases are so few in number, I shall reproduce the facts in each case, stating them as concisely as possible, and adding a reference to the fuller accounts given elsewhere.

1. The patient removed from New York to Minnesota some ten years since, and has had robust health up to this time (1875). The recovery had, however, taken place prior to the change of residence. He had made a voyage to Europe, and passed a winter at the south. (No. 17, page 274.)

2. The patient engaged in mercantile business in New York, removed to Orange, N. J., coming into town daily. This case as well as the preceding is in the list of recoveries. No. 3 of recoveries in which the histories are defective as to medication (page 283).

3. The patient after a voyage around Cape Horn settled in California. This case is in the list of recoveries, No. 7 of the cases in which the histories are defective as to medication (page 283).

4. The patient, a physician, removed to a situation on the summit of the Alleghany Mountains, and was much of the time in the open air on horseback. This case is in the list of cases of arrested or non-progressive phthisis, No 1 of the cases which had no medicinal treatment (page 285).

5. The patient, after spending several winters in the West Indies, removed from New York City to Mount Clair, New

Jersey. This case is No. 2 in the same list as the preceding case (page 285).

6. The patient, after spending the spring and summer months in Europe, removed from New York City to Morristown, New Jersey. This case is No. 4 in the same list as the preceding case (page 286).

7. The patient after a winter in Nassau, a winter in Aiken, travelling in Europe, and a voyage around Cape Horn, removed to Southern California. This case is No. 5 in the same list as the preceding case (page 286).

8. The patient removed from Boston to New York City. This case is No. 1 in the list of cases of arrested or non-progressive phthisis, the histories of which are defective in regard to medication (page 290).

9. The patient, having had phthisis slowly progressing for many years, removed to Southern California, and for a year or two there was notable improvement. He relinquished, in a great measure, the care of a large medical practice in removing, and engaged in agricultural pursuits. This case is No. 2 in the list of cases of slowly progressive phthisis (page 291).

10. The patient, having been engaged in business in New York City, removed to the country and became a farmer, with notable benefit. This case is No. 16 in the list of fatal cases having had no medicinal treatment (page 308).

11. The patient removed from Buffalo, N. Y., to a town in New Hampshire, and died not long after his removal. This case is No. 8 in the list of fatal cases treated with cod-liver oil (page 316).

12. The patient, a practising physician, removed from Brooklyn, N. Y., to St. Paul, Minnesota, with temporary benefit. This case is No. 11 of the fatal cases treated with cod-liver oil (page 318).

13. The patient, a portrait painter, removed, early in the disease, from Buffalo, N. Y., to the South, either Georgia or Florida, returning four years afterward and dying shortly after his return. The case is No. 4 in the list of fatal cases, the histories of which are defective as regards medication (page 330).

Thus, of the foregoing 13 cases, 3 recovered; in 5 the disease was arrested or non-progressive, and one case is included in the cases of slowly progressive phthisis. The remaining 4 cases are in the list of those ending fatally. In 2 of these 4 cases the removal was apparently beneficial; it was probably so in a third case, and in one case the patient did better before changing his residence. (Case No. 9.)

Change of Occupation.

In 8 cases there was a change of occupation. The change in these cases was made with reference to more out-of-door life, so that these cases properly enough might have been embraced under the heading "change of habits," in the second class. The facts in these cases severally relating to the change of occupation are as follows:—

1. The patient was a compositor, and exchanged this occupation, after several weeks in the country, for that of a salesman in a paper warehouse. The case ended in recovery without medication. (No. 2, page 379.)
2. The patient left school teaching, attended medical lectures, and after graduation, engaged in medical practice. The case ended in recovery without medication. (No. 3, page 379.)
3. The patient, a joiner, became a farmer. The case ended in recovery. Treated with cod-liver oil. (No. 1, page 281.)
4. The patient, a clerk, became a farm laborer. The case ended in recovery. Treated with cod-liver oil. (No. 2, page 281.)
5. The patient, a clerk, became a travelling agent. The case ended in recovery. Treated with cod-liver oil. (No. 6, page 282.)
6. The patient, a clerk, after a sailing voyage and travelling in Europe, became a farmer, first in New Jersey, and afterward in Rhode Island. The case is in the list of those in which the disease was arrested or non-progressive without medication. (No. 10, page 287.)
7. The patient, a clerk, relinquished this occupation, and lived much out of doors with no pursuit except for the recovery of health. This case is in the list of cases of slowly progressive phthisis. (No. 6, page 292.)
8. The patient, who was engaged in business in New York, went into the country, and became a farmer with much benefit. This case is in the list of fatal cases which had no medicinal treatment. (No. 16, page 308.)

A long Sea Voyage or a Series of Voyages.

There are twenty cases coming under this heading. In several of these cases other hygienic measures entered into the treatment, and they are, therefore, also in the foregoing classes. Of the twenty cases, three ended in recovery; two are in the list of cases in which the disease was arrested or non-progressive, and two are in the list of cases of slowly progressive phthisis. Of the remaining thirteen cases, six are in the list of fatal cases, and 7 are among the cases of uncertain duration or termination.

The facts pertaining to the voyage or voyages in the twenty cases, severally, are as follows:—

1. The patient made a voyage in a sailing vessel to Gibraltar. Case No. 7 among the cases ending in recovery without medication (page 280).

2. The patient made a voyage to Liverpool and back in a sailing vessel, as surgeon of the ship. Case No. 14, among the cases ending in recovery without medication (page 280).

3. The patient made a voyage around Cape Horn. Case No. 7, among the cases ending in recovery, the histories being defective as regards medicinal treatment (page 283).

4. After travelling in Europe, passing one winter in Nassau, and another in Cuba, the patient made a voyage around Cape Horn, and settled in Southern California. Case No. 5, among the cases of arrested or non-progressive phthisis, not treated medicinally (page 286).

5. The patient made a voyage to Marseilles in a sailing vessel, and afterward became a farmer. Case No. 10, among the cases of arrested or non-progressive phthisis not treated medicinally (page 287).

6. The patient made two voyages to Europe. Case No. 1, among the cases of slowly progressive phthisis (page 291).

7. The patient made several voyages to Europe. Case No. 3, among the cases of slowly progressive phthisis (page 292).

8. The patient made a voyage to Portland, Maine, from New York, returning by sea, with benefit. Case No. 8, among the fatal cases not treated medicinally (page 304).

9. The patient made several voyages in steamers and sailing vessels, with, apparently, notable benefit. Case No. 9, among the fatal cases not treated medicinally (page 305).

10. The patient made a voyage to Liverpool in a sailing vessel, with benefit. Later in the progress of the disease he made a voyage to the West Indies without benefit. Case No. 13 of fatal cases not treated medicinally (page 307).

11. The patient sailed for Liverpool, and died shortly after the voyage. He suffered much from sea sickness, and was kept on very low diet. Further details pertaining to his death not ascertained. Case No. 15 of fatal cases not treated medicinally (page 307).

12. The patient made a voyage around the world, with notable benefit. Case No. 22, among the fatal cases not treated medicinally (page 310).

13. The patient made a voyage to London, and returned as surgeon to the ship, with much benefit. Case No. 7 of the fatal cases treated with cod-liver oil (page 315).

14. The patient, mother of a large family, had made ten voyages across the Atlantic. The disease non-progressive for thirteen years. Case No. 4, among those of uncertain termination or duration, not treated medicinally (page 337).

15. It is noted simply that the patient made a sea voyage without benefit, dying soon after his return. Case No. 9, among the cases of uncertain duration or termination, not treated medicinally (page 349).

16. The patient crossed the Atlantic several times, with benefit. Case No. 13, among those of uncertain duration or termination, not treated medicinally (page 350).

17. The patient made a voyage around Cape Horn and travelled in Europe, with benefit. Case No. 17, among the cases of uncertain duration or termination, not treated medicinally (page 351).

18. The patient went to London in a sailing vessel, and returned much improved, having gained ten pounds during the voyage. Case No. 12, among the cases of uncertain duration or termination, treated with cod-liver oil (page 358).

19. The patient sailed to China, and gained in weight during the voyage twenty-five pounds, the pulmonary symptoms becoming insignificant. He lost in weight during his stay in China and during the return voyage. Case No. 15, among the cases of uncertain duration or termination, treated with cod-liver oil (page 358).

20. The patient crossed the Atlantic and spent three months

in Dublin, with apparent benefit. Case No. 15 of the hospital cases of uncertain duration or termination, treated with cod-liver oil (page 362).

Thus, of the thirteen cases, exclusive of those ending in recovery, of the cases of arrested or non-progressive phthisis, and of the cases in the list in which the disease was slowly progressive, in all save two cases (Nos. 11 and 15) the sea voyage or voyages were apparently beneficial, and in some of the cases in a marked degree. We are certainly authorized to conclude that in a large majority of cases this measure has a favorable influence on phthisis. In view of this conclusion, inasmuch as sea voyages, although of short duration, are involved in many of the cases in which there was a change of climate, it seems a rational inference that to them is fairly attributable, in some degree, the benefit apparently derived from the latter.

The conclusions drawn from the facts contained in the summary of the hygienic treatment may be embodied in the following propositions:—

1. Benefit, more or less marked, is derived, in a large proportion of cases of chronic phthisis, from a temporary change of climate. This benefit seems to relate more to circumstances which are accessory or incidental to the change, than to any special climatic agency.

2. Change of habits, from those which are sedentary and confining within doors, to those involving out-of-door life and activity, has a favorable influence in cases of phthisis, which is, perhaps, greater than that proceeding from any other class of hygienic measures. It is probable that the influence from this source explains, in part, the benefit derived from change of climate.

3. The benefit derived from change of occupation is due to a change of habits, involving more out-of-door life and activity.

4. A permanent change of residence is beneficial in certain cases, the favorable influence being more or less attributable to accessory circumstances.

5. Sea voyages have, in a large proportion of cases, a favorable influence, which is sometimes very great, and this is an accessory circumstance which in certain cases contributes a share of the benefit derived from a change of climate.

REMARKS ON THE TREATMENT OF PHTHISIS.

Abstracts of my recorded cases of phthisis, preparatory for these studies, were made in 1870. The studies, therefore, do not embrace the cases which have come under my observation during the past five years This explains the omission of arsenic as a remedy, save in a very few of the histories. I have prescribed arsenic to some extent in cases which I have treated during the period just stated, but I do not consider my experience sufficient to offer an opinion as to the value of this remedy. These remarks will apply to another remedy which has been introduced within a few years by Dr. Dobell, namely, the pancreatic emulsion. My studies in relation to medicinal treatment have embraced chiefly the hypophosphites, cod-liver oil, and alcoholics in considerable or large quantity.

Respecting the hypophosphites, I do not consider that I have presented facts sufficient to serve as the basis of any estimate of their value. The extraordinary claims in their behalf, as a specific for phthisis, which were first set forth nearly twenty years ago by Dr. Churchill, he has lately reiterated, and he supports these claims by their apparent efficacy in a considerable number of cases. It is, however, no proof of the efficacy of a remedy that, in a considerable number of selected cases of phthisis, the disease either ends in recovery, or ceases for an indefinite period to progress, or progresses very slowly. My collection of cases has furnished a considerable number of such instances without any medicinal treatment. The efficacy of a remedy can only be tested by a number of cases taken indiscriminately, and sufficiently large to render it impossible to refer the favorable course in all to an intrinsic tendency. With these few remarks I forbear any judgment as to the validity or force of the clinical evidence advanced by Dr. Churchill in support of his claims in behalf of the hypophosphites, simply adding that the fact of his claiming to have recently discovered medicated inhalations which are prophylactic and curative in regard not only to phthisis, but to most pulmonary diseases, and his withholding the alleged discovery from the profession, will not be likely to enhance confidence in his prior claims respecting the hypophosphites. It is but fair to say, however, that the hypophosphites have appeared to be useful in the treatment of phthisis by other observers, and I can say as much as this from my own experience during the last five years.

Cod-liver oil has entered largely into the treatment of phthisis in this country, as well as in Great Britain and other countries, since its introduction by Dr. J. Hughes Bennet, in 1841. It has been, and is now, regarded by very many, if not most physicians, as a remedy of much value in this disease. As far as my studies go in relation to it, they render highly probable, if they do not prove, its value; but they do not afford evidence of great remedial potency. There is no ground for the opinion that it has any specific efficacy. To attribute, as has been done, the increase in the proportion of recoveries from phthisis within the last quarter of a century, to the use of the cod-liver oil, is certainly unreasonable. That recoveries within the period just named have been more numerous than previously, is undoubtedly true. It may also be assumed as true that the duration of the disease in fatal cases, has been prolonged; the disease is better tolerated. It is comparatively rare, now-a-days, to see phthisical patients bed-ridden for months before death, the body reduced to the extreme limit of emaciation and debility, the patient often, in the last days of life, harassed with ulcerations of the hips or nates. In these respects consumption now differs widely from what it was forty years ago. It is an error to attribute all this to the cod-liver oil. According to the oil a certain amount of value, the contrast between the present and the past in respect of the greater number of recoveries, the prolonged duration, the better tolerance, and the circumstances connected with the fatal termination, is to be explained by improved views pertaining to alimentation and hygienic treatment, together with the discontinuance, or the more sparing use, of the measures formerly known as antiphlogistic. Such, to my mind, is the rational explanation, and, so thinking, I cannot forbear saying that, as it seems to me, it would be most unfortunate if the recent revival of the doctrine that phthisis is to be considered and treated as a purely local inflammatory affection, should lead to a return to those measures of treatment.

Cod-liver oil being useful, it should, of course, enter into the treatment of phthisis. It cannot, however, be employed in all cases. In not a few cases the stomach does not tolerate it. It impairs appetite, causes nausea, disorders digestion, and occasions diarrhœa. Under these circumstances, it is more than useless to persist in its use. Whatever benefit is to be derived from it, is limited to the cases in which it is well borne and digested. A great aversion to it is probably a sufficient reason for not persisting in its use. With regard to the time of its administration, my experience is in accord with that of others, namely, it is best taken shortly after meals, and the quantity given at a dose should rarely, if ever, exceed half an ounce. Many patients, if not at first, after a time, take it without antipathy. For such patients, no preparation is requisite. For those to whom the idea of the pure oil is repulsive, the preparation with lime and some aromatic addition, is divested of the appearance and the oleaginous sensation which excite disgust.

Waiving here, as in a previous connection, discussion of the question whether cod-liver oil is to be regarded as a remedy or an aliment, I will only remark that its limited usefulness is most consistent with its being a nutriment and not a drug. The apparent usefulness of other varieties of fat is confirmatory of this view. The question is not without an important practical bearing; for, if all fats are measurably useful, it is desirable that patients who cannot take the cod-liver oil, should make trial of other fatty articles. Cream is an eligible form, because it is less likely than other varieties to excite disgust, and it can be taken with various articles of diet. Of course, these advantages apply alike to butter. The fat meats should be advised as largely as the taste and tolerance of the digestive system will allow. I will remark here that phthisical patients by no means always, or even generally, have a repugnance to fat meat. I could cite from my recorded cases instances in abundance showing that it is an error to say that phthisis is characterized by an inappetence for fat.

Of the use of the pancreatic emulsion introduced by Dr. Dobell, I have had some practical knowledge, but my experience is not sufficient to justify an opinion of its value in the treatment of phthisis. Dr. Dobell has reported a considerable number of cases in which it was taken with apparent benefit, when cod-liver oil could not be taken, or when the latter was not well borne. Without either accepting or rejecting the theory that the etiology of phthisis involves a defective secretion by the pancreas—it is not an irrational conjecture that the pancreatic emulsion may be more useful than pure fat or oil, as well as less unpleasant to the palate and better tolerated. I will add, that I have known instances in which the emulsion was apparently useful.

Of the usefulness of alcoholics given in considerable or large quantity, my studies have furnished striking examples. The instances of recovery, arrest, and slow progress of the disease, and tolerance under their use, are too marked and numerous to be accounted for as mere coincidences. Not only, however, are they not always signally useful, but their usefulness is limited to a certain proportion of cases. So far as I can judge from my experience, they are useful in the cases only in which they can be taken considerably or largely without alcoholic excitation, or any immediate unpleasant effects. There is a very marked difference among phthisical patients in this regard. Some are in no wise immediately affected otherwise than that a sense of comfort or well-being is induced, and they may tolerate a much larger quantity than they were able in health. Others are either excited, or flushed, rendered unpleasantly dull, or in some way made uncomfortable. In the former class of cases, benefit may be looked for; in the latter class, it is not to be expected. The appropriateness of alcoholics is, therefore, to be determined in each case experimentally. The quantity to be taken is also to be thus ascertained. It is not only safe, but proper, to advise patients to take such a quantity per diem as can be taken without any apparent excitation of the nervous system, or of the circulation, and with no unpleasant immediate effect. The form is, in the same way, to be determined experimentally in each case. There is no rule of general application with regard to the choice among the different kinds of spirit, wine, or malt liquors. The form of alcoholics which is found by experience to suit best in individual cases, is to be selected; and it is sometimes advantageous for patients to change the form from time to time. Alcoholics are best taken at or near the times of taking food, but their use should not always be restricted to these times. Here, as in other points relating to their use, the experience in each case should be the guide. They may often be taken with benefit at bedtime. I take this occasion to repeat a statement which I have repeatedly made heretofore, namely: among the great number of cases in which I have advised alcoholics to be taken as a therapeutical measure in cases of phthisis, I have never known of a single instance of a patient becoming addicted to their use. As a rule, patients are glad to discontinue their use when it is considered judicious to do so. On this point I desire to be understood as speaking deliberately and emphatically. A physician might very properly hesitate to advise the free use of alcoholics, even with an expectation of effecting a cure, if there were much risk of this favorable result carrying with it the physical evils of alcoholism, or the moral evils of intemperance. Happily, the physician need not be restrained by an apprehension of these evils from securing whatever benefit is to be derived from the alcoholic treatment in the cases to which it is applicable. Let me add, that I would not be understood to sanction a possible inference that, inasmuch as alcoholics are useful in certain cases in the treatment of phthisis, their use is to be advised by way of prophylaxis, for any who may fancy or affect to fancy themselves to be in danger of having this disease. It is easy to see that such advice, given indiscriminately, would involve a fearful moral responsibility on the part of the physician. I do not doubt that the medical profession sometimes receives undeserved censure, because some of those who become addicted to the use of alcoholics, find it convenient to resort, for an excuse, to the falsehood that they were taken under the advice of a physician.

In these remarks on alcoholics I here had reference to their use in considerable or large quantity. It is only when thus used that they are to be considered as constituting a potential remedy. Given in small or moderate quantity, they entered into the treatment of a very large proportion of my cases in hospital and private practice. I have not undertaken to analyze the cases with reference to the influence of alcoholics as thus used; but I cannot doubt their usefulness, as accessory to an analeptic, restorative or supporting plan of treatment. If they improve appetite and promote assimilation, they must be useful, and they often seem to have these effects. Aside from these effects, they may operate, measureably, in the same unknown mode in which, in a considerable or large quantity, they are, in certain cases, so signally useful. They are taken in a small or moderate quantity without any unpleasant effects by a large proportion of those who do not tolerate them well in a considerable or large quantity. The quantity when small or moderate, as when considerable or large, is to be determined in individual cases by the immediate effects; so, also, the form of alcoholics and the time of taking them. The experience of the patient is to be the guide, and this will be found often to dictate successive changes in the form used, and in other circumstances.

I am led by the foregoing remarks to notice next the dietetic treatment of phthisis. The importance of alimentation in this disease may be measured by the significance in prognosis of appetite, digestion, and nutrition. Recovery cannot take place, the disease, in fatal cases, will not be very slowly progressive, its duration prolonged, tolerance of it maintained, if the conditions of assimilation do not approximate to those of health. This statement is sustained alike by clincial experience and common sense. Hence, alimentation is an essential part of the treatment.

What is the diet to be allowed to patients affected with phthisis? The answer to this question, as it seems to me, is very simple. A phthisical patient should not only be permitted, but enjoined, to take all kinds of wholesome food, following the dictates of appetite and taste. This very plain rule of dietetics applies, not only to phthisis, but to most chronic affections. Believing, as I do, that the instinctive desires respecting food, are more reliable as expressing the wants of the system than any regulations of diet based on speculative views, my practice is to encourage patients to exercise entire freedom in the choice of articles and the degree of indulgence. To forbid what is preferred, and prescribe what is not liked, is, in my judgment, bad dietetic treatment. Even the patient's own experience as to the digestibility or otherwise of different kinds of food, is to be regarded with distrust; for the digestion of particular meals is liable to be disturbed by a variety of circumstances extrinsic and intrinsic, and a dish which may appear to occasion dyspeptic ailments on one day, may be digested with ease on another day. If an article of diet be taken with the expectation, in the mind of the patient, that it will disagree, this result will be likely thereby to be produced. Moreover, it is far better to incur a risk of labored or defective digestion, than the positive evil of an insufficient alimentation. I shall content myself with these general statements with respect to the diet in cases of phthisis.

Remedies to increase appetite and promote digestion are important in proportion to their efficiency in accomplishing these objects. The salts of quinia, and the various vegetable bitters, the mineral acids, strychnia or nux vomica, and arsenic are useful in this way. Hygienic measures for these objects are still more useful. Indeed, there is reason to believe that the benefit of change of habits as regards exercise and out-of-door life, sea voyaging and climatic influences, chiefly consists in the effect on the series of processes which end in nutrition. Hence, there is good reason for the significance which belongs to increase in weight as evidence that the pulmonary affection is not progressive. The anæmic condition in cases of phthisis suggests the propriety of chalybeate tonics. These have been regarded as hazardous from a supposed tendency to induce hæmoptysis. This view seems to me to have no foundation but on conjecture. I have prescribed iron, in its various forms, in many cases of phthisis, and while I am not certain that it is of much use, I have never seen occasion to attribute to it any evil effect. Were it true that it renders patients more prone to bronchial hemorrhage, in view of the significance of this symptom as regards prognosis, it might, perhaps, be cited in evidence of the usefulness of the remedy.

My studies confirm an opinion generally entertained in this country, namely, that a favorable influence on phthisis is exerted by a change of habits from those which are sedentary and confining within doors to those involving out-of-door life and activity. Among the cases analyzed are many which exemplify this favorable influence. To secure it in individual cases is, therefore, an important object in the treatment. The mode in which this object is to be accomplished must be determined by the circumstances in each particular case. A change of occupation is sometimes advisable. My cases of recovery, of arrest, and of slowly progressing phthisis, embrace examples of clerks, men whose business kept them in the store or counting-room, mechanics, such as compositors, joiners, harnessmakers, etc., becoming farmers, or taking employments pursued in the open air, or requiring more active exercise. Such changes, however, are not always practicable, and it must then suffice for patients to devote as much time to out-of-door life and activity as is consistent with occupations which cannot be relinquished. Gymnastic exercises may be recommended if they involve recreation, and provided they are not carried to the extent of producing overstrain or exhaustion. In a case, not in this collection, which was under my observation for from ten to fifteen years, the patient, whose business was sedentary, and which he never relinquished, adopted a plan of systematic exercise in a gymnasium, keeping it up regularly for many years. Notwithstanding the existence of phthisis, he acquired great muscular strength, and became noted as a gymnast. I did not record the case which would properly have been embraced in the list of cases of arrested phthisis. The case ended fatally after a duration of over twenty years. What is known as "the health-lift" secures safe and salutary muscular exertions for those who have but little time to spare for hygienic measures. I have known of its being apparently useful in phthisis. For those who are able to control all the circumstances pertaining to habits of life, the hygienic treatment should embrace, if possible, pursuits which, while they secure the physical advantages sought for, satisfy the higher wants of the mind, and, in lieu of these, rural sports, such as shooting, fishing, riding, boating, etc. The extent to which habits of activity are to be carried, must depend on the muscular strength and endurance, the effect of exertions on respiration, etc. It is never judicious to carry these habits to the extent of inducing great fatigue or prostration, and exertions should never be so violent as to occasion an uncomfortable sense of the want of breath. Dr. James Henry Bennet has made some pertinent remarks on the abuse of exercise in cases of phthisis.[1] It is not very rare for over-zealous patients to practise muscular exercise to an injurious extreme. On the other hand, it is quite common for patients to be deterred from being out of doors, save under the most favorable circumstances of weather, by the idea that the disease is liable to be increased in consequence of "taking cold." In the first place, the liability to bronchitis is certainly not rendered greater by living as much as possible in the open air, but it is probably lessened. In the second place, bronchitis is rarely attributable to ordinary changes in the temperature and moisture of the atmosphere. In the third place, an attack of bronchitis involves very little, if any, danger of an increase of the phthisical affection. This last statement is quite the reverse of the popular belief which attributes the origin of phthisis to neglected "colds," and it is also in opposition to recent theoretical views in pathology, which assume a bronchitis to be the starting point in the development of phthisis, but it is in accordance with ample and careful clinical observation. We are warranted, therefore, in saying to patients that their habits of out-of-door life need not be restricted by apprehensions connected with "taking cold."

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[1] On the Treatment of Pulmonary Consumption, etc. London, 1871, and New York, 1872.

It is superfluous to say that salubrity of residence, together with all well-known sanitary conditions relating to ventilation, over-crowding, etc., are important parts of the hygienic treatment of phthisis. A malarial locality is to be avoided, and this may be done often without a removal to any great distance. It is to be borne in mind that Bowditch's researches in Massachusetts appear to show conclusively a relatively larger number of cases of phthisis in low situations proximate to streams and ponds. These situations are, therefore, to be avoided. The importance of sufficient space in work-rooms, shops, and offices, and sleeping apartments, together with ample provisions for ventilation, needs only to be referred to.

I can testify to the apparent benefit from sponging the body daily in cool water, followed by brisk friction, as advised by Dr. J. Henry Bennet, from his own personal experience, as well as from his observation in cases under his charge. In two of the cases which I have analyzed, the cold pack was employed for a considerable period with apparent benefit.

In regard to clothing, there are two opposite extremes into which patients are apt to fall, namely, too much and two little. The former is vastly more frequent than the latter. Patients whom I examine frequently remove from the chest a thick woollen under-shirt, and perhaps more than one, a "chest protector," made of several thicknesses of cloth, or of fur, together with a superabundance of other garments, and this, sometimes, when the weather is but moderately cold. Heavy woollen clothing is often worn even in the warm weather of summer. The effect is to keep the surface in a constant perspiration which is not only uncomfortable, but a source of debility. The error in this extreme proceeds from false notions which prevail respecting the liability, in cases of phthisis, to "colds," and their danger. On the other hand, occasionally patients are insufficiently clad, not on account of poverty or indifference, but from the notion that the body is invigorated by such an exposure to cold. I have met with phthisical patients who wore linen next to the skin without any woollen or silk under-garment, during the coldest of weather. I suppose that in all cases, the surface of the body should be covered by closely fitting garments of wool or silk. The importance of these consists in the material being a better non-conductor of heat than either linen or cotton. In warm weather the garments may be quite thin. As regards their thickness or thinness, as well as the quality and quantity of other clothing, the rule of guidance is, as it seems to me, a very simple one, and it is expressed in one word, namely, comfort. Adaptation to true comfort is a rule which is applicable, not only here, but to hygiene in general. Assuming the absence of perverted desires and abnormal habits, whatever is conducive to comfort is usually healthful, and *per contra*, whatever conflicts with comfort is opposed to the hygienic conditions of health.

Change of climate is generally believed, both by patients and physicians, to be a hygienic measure of great efficiency in the treatment of many cases of phthisis. The question, how far this belief is well founded, is obviously one of importance. Its importance is enhanced by the fact that the measure involves an expense which, in many cases, is an insuperable obstacle, and often much sacrifice from the interruption of business, together with separation from friends, the fatigues and accidents of travelling, and more or less risk of dying away from home. These considerations frequently impose upon the physician not a small responsibility in advising the measure; and, on the other hand, if he have not advised it in certain cases which end fatally, he may be exposed to censure and self-reproach for not having done so. And when a change of climate is decided upon, then comes another question which often is a difficult one, namely, what particular climate and place shall be selected? The difficulty connected with this question relates to the conflicting claims of the different parts of the world to which phthisical patients resort, the differences of opinion concerning the climatic elements in which consist a favorable influence over the disease, and the conflicting testimony of patients, or their friends, in relation to the apparent influence of different climates.

My studies seem to lead to conclusions at variance with the prevailing popular and professional belief in a special climatic influence. In the first place, it does not appear from the analysis of my cases that changes of climate have in a marked degree a beneficial influence, as compared with the hygienic measures available at home. In the second place, the improvement following a change appears to pertain alike to different climates and places. Hence, it seems a fair inference that the benefit derived from the change is due, not so much to a climatic influence, *per se*, as to the circumstances incidental to the change. These circumstances are, often, a change of habits from those which are sedentary and confining within doors to those involving out-of-door life and activity, freedom from the cares, anxieties, and annoyances of business at home, and, it may be added, the moral effect of the hope or expectation of being benefited by climatic influences. The last of these accessory circumstances, of course, never, and the others, in many instances, cannot be secured fully unless the patient go away from home, especially assuming the change to be for a climate more favorable for out-of-door life.

If this be a correct view of the sources of benefit to be derived from a change of climate, it is practically important as enabling the physician better to decide in what cases this measure will be likely to be useful, and where patients are to be advised to go. Divesting the measure of any special climatic influence, the question, first, as to any change, and second, as to the place to be selected, will embrace a consideration of the accessory or incidental circumstances, and particular cases are to be considered separately with reference to these. The following are some of the points which, as it seems to me, are to be taken into account in deciding whether a patient should go away from home, and, if so, where he should go.

Is the patient so situated that, remaining at home, habits of out-of-door life and activity will not be likely to be adopted and persevered in; this is a good reason for a change of climate. Some professional men and men of business are, not infrequently, so situated.

Is the climate in which the patient resides, at certain seasons so inclement as to interfere with habitual out-of-door life; this is a sufficient ground for advising, during these seasons, a climate more favorable for living in the open air.

Is the idea of the change agreeable to the patient, and, if it require separation from family or friends, will he not be rendered thereby depressed; there may be ground for encouragement, whereas, if the idea be disagreeable, and the absence from home will give rise to melancholy, the measure is of doubtful propriety.

These points apply to any climate which is more or less distant. Now, the climate in itself is of secondary importance, assuming, of course, it to be salubrious. All the conditions of salubrity may be combined in numerous places situated in either a northern or southern latitude. It is not essential to canvass the respective claims of different places in respect of climatic conditions, after having decided whether a cold or a warm climate is to be preferred. My cases furnish examples of recovery, arrest, slow progress, and more or less improvement alike among patients who went to a warm and to a cold climate. Whether a cold is to preferred to a warm climate, in particular cases, must depend on the predilections of the patient, the pae. individual experience as regards the relative effect of coldge, warm weather on the feelings and the general health, the abcene to take muscular exercise, the power of resisting or reacthental cold, and other circumstances proper to each case. It me. For bably be assumed that a warm climate is best suitedisturbed majority of cases. ference to

In the choice of a place, be it in a warm or cold c particular following points are to be considered:— h examples,

For a patient whose habits or tastes have rendeup for a consable certain comforts or luxuries pertaining to and surroundings, the place selected must afforccount of a case which exemplifies the continued influences of change of climate, out-of-door life, and travel on horseback. The case is especially interesting, as the account was given to me by a distinguished member of the medical profession, and it was of his own personal experience. In June, 1871, I examined the chest of Surgeon ——, U. S. Army, with a negative result. In 1862, he had a great number of attacks of hæmoptysis—as many as one hundred, the hemorrhage in all small. He had cough and copious expectoration, with emaciation, muscular feebleness, and night sweating. The diagnosis of phthisis was made by two eminent physicians in New York, both of whom are distinguished as experts in physical exploration. Under these circumstances he procured an order to go to New Mexico. When he arrived there he obtained a position, at his own request, to accompany an expedition against the Indians. He was three months on this expedition; on horseback during the day, sleeping out of doors, and living on game with a little hard biscuit. He rapidly improved, and he had since had no return of hæmoptysis. He lost his cough, and had been free from any pulmonary symptom of disease. He was afterward sent to Louisiana and had yellow fever there. Since his recovery from the pulmonary affection, he had had frequently recurring hæmorrhoidal hemorrhages. His appearance denoted perfect health.

My studies lead me to place a high estimate on the favorable influence of sea voyages. This is a measure which in many chronic affections is attended by most happy effects. It is, however, obviously available in only a certain proportion of cases. In general, to avail themselves of it, patients must be free from domestic ties; they must be able to endure without unhappiness separation from home and friends, and it is desirable that they should have a fondness for life at sea. Prolonged sea-sickness prevents benefit from this measure, and may, indeed, render it hazardous. Hence, it may be advised with greater confidence if the patient knows by experience that sea-sickness will be of short duration. The circumstances relating to the general condition of the patient, which contraindicate travelling to a distant climate, are opposed to the advisability of a long sea-voyage. The latter, however, may be well tolerated under circumstances which would render it generally neither advisable nor safe. I will cite a striking illustration of this fact. I was requested to visit a lady from 40 to 50 years of age, in the country, with reference to the propriety of her going by sea to California, where her husband resided. I found her feeble, emaciated, having daily paroxysms of fever, and advanced pulmonary disease as shown by physical signs. It was obvious that the voyage involved risk of dying at sea, and the object of my visit was to co-operate with her physician in dissuading her from it. This was in the summer season. In the winter she came to town, her condition remaining not materially altered. She was bent on the voyage, being anxious to go to her husband who was so situated that he could not come to her. Taking into view her mental condition, I was led to advise that the voyage be undertaken, with a full understanding, on the part of her friends, of the danger of death before it was completed. The voyage was not only safely accomplished, but she seemed to gain strength from it, and lived several months afterward.

Here was a powerful moral influence at work, and it is only fair to cite the case in illustration of the tolerance of the voyage.

A full consideration of the treatment of phthisis should embrace the indications for remedies to palliate cough and expectoration, diarrhœa, night sweating, increase of heat or fever, etc. As my clinical studies have not embraced analyses with reference to these symptoms, I shall content myself with a very few words respecting this part of the treatment.

Expectorants have no place in the treatment of phthisis. An expectorant remedy which includes nauseants, must do harm by interfering with alimentation and digestion.

Cough palliatives containing opiates are, in general, hurtful, for the same reason. They are allowable only when the violence or frequency of cough causes fatigue and prevents sleep. They are allowable, or advisable, then because, although an evil, they are the means of relieving a greater evil.

Diarrhœa may claim opiates and astringents, notwithstanding the objections to the former from their effect on appetite and digestion. If, however, the diarrhœa depend, not on ulcerations, but on intestinal indigestion, it will be more effectually relieved by tonic remedies, pepsin, and alcohol.

Night sweating occasions much annoyance, disturbs sleep, and is a cause of debility. It is important, therefore, to control it, if possible, by the different remedies and measures which I need not here particularize.

Daily paroxysms of fever are sometimes either prevented or much modified by quinia, in antiperiodic doses. Given in full doses during fever, its antipyretic power is sometimes marked. I cannot, from personal observation, offer testimony concerning the propriety of employing the cold bath, or the wet pack, in order to abstract heat from the body, when this is much increased. The efficiency and usefulness of these measures in diminishing hyperpyrexia in other pathological connections, constitute a sufficient warrant for giving them a fair trial in cases of phthisis.

A highly important point of inquiry may be appropriately considered in connection with the treatment of phthisis, namely, the influence of marriage on the disease. Shall the physician approve of the marriage of phthisical patients? This question, with reference to its consequences, has three aspects: 1. The probable effect on the patient; 2. The effect on offspring; 3. The possibility of the communication of the disease from the husband to the wife, or the wife to the husband. Before offering some remarks on the question, I will adduce the facts which are contained in the histories of my cases.

Among my cases are fifteen male patients who married after becoming phthisical. I shall give a synopsis of the history of each of these cases.

Case 1. Capt. F., aged 42, widower, had slight cough and hoarseness in January, 1857. Nine or ten years previously he had had hæmoptysis, but in the mean time his health had been excellent. On July 31, 1857—prior to this time not having considered himself an invalid, the cough being slight and his general condition good—he had an attack of profuse hæmoptysis. The hemorrhage recurred on the day following. On this date he was married, in order that the lady to whom he was engaged might, with propriety, be in constant attendance upon him. The hemorrhages recurred for several successive days.

He kept the bed for the most part from this time. He suffered much from dyspepsia, and death took place in the following September, about six weeks after marriage.

Case 2. Dr. C., aged 25, had an attack of hæmoptysis March 23, supposing himself to be in perfect health. At this time the only physical evidence of a pulmonary affection was a relatively feeble respiratory murmur at the summit of the chest on the left side. He had no cough. Shortly after this occurrence he had pleurisy, with effusion. In May, 1858, the left side of the chest was much contracted, and he had a pleural friction murmur. The pleurisy had not been ascertained, and he had been treated for intermittent fever. He had now no cough, and his general health was good. In the autumn of this year he married. I met him in the spring of 1859, but made no examination of the chest. He reported well, but he was pallid and thin. No further details are noted excepting that his death with phthisis took place in the spring of 1860, about eighteen months after marriage.

Case 3. Mr. U., aged 27, had hæmoptysis in June, 1857, having not had previously cough, and being apparently well. Cough continued from that date. In April, 1858, the physical signs showed a considerable affection at the summit of the left lung. He had lost twelve to fourteen pounds in weight. He had recently had another hæmoptysis. The treatment had consisted of cod-liver oil, with alcoholics moderately. He married in the summer of 1859, and died in the spring of 1860, from eight to ten months after the date of marriage.

Case 4. Dr. E., shortly after entering upon the practice of medicine, had a slight hæmoptysis, not preceded nor followed by cough. An examination of the chest at that time was negative. Six or eight years afterward he had a second hæmoptysis, and from this time cough had continued. An examination of the chest after the cough had continued for two years (September, 1860) showed a moderate affection at the summit of the right lung. Meanwhile he had married. He continued actively engaged in the practice of medicine, connected also, first as demonstrator, and afterward as professor, of anatomy in a medical school for ten years or longer, when he removed to Southern California, where he died ; meanwhile his wife had died, and he had again married.

Case 5. Dr. T., aged 27, actively engaged in practice, in October, 1863, had had cough and expectoration for some time—the precise duration not noted. His father had died with phthisis. The physical signs showed a small affection at the summit of the right lung. An examination was made in July, 1864, with the same result. His general health was fair. He has since remained in fair health (August, 1875). He married within a few years after my examinations, the date not noted.

Case 6. D. S. N., aged 27, had profuse hæmoptysis repeatedly in the summer of 1865. The physical signs showed a small affection at the summit of the left lung. The cough was slight. He went to Europe, and after his return, in October, 1866, he had the appearance of perfect health, and there were no pulmonary symptoms of disease. He engaged in banking in New York, and married in January, 1867. He went to Savannah during the spring months, where he had a slight hæmoptysis. During the following summer his health was excellent. He removed to Minnesota in the autumn of 1868, and has since remained there, becoming robust, and entirely free from symptoms of pulmonary disease.

Case 7. Dr. O., aged about thirty, had profuse hæmoptysis in September, 1868. Cough had existed for three months, but it had been slight, and he paid no attention to it. The physical signs showed a small affection at the summit of the right lung. A subsequent examination showed an increase of the affection, but the signs were not noted. In April, 1870, I noted that he went to Europe, but quickly returned, engaged in practice, and married. Death took place within a year afterward, the date not noted.

Case 8. Mr. B., in January, 1869, had cough and expectoration, with loss in weight and fever. The signs showed a moderate affection at the summit of the left lung. In February he took passage in a sailing vessel for Marseilles, and improved notably during the voyage. In June, 1869, he had a healthy aspect, and had gained in weight twenty pounds, the signs of the pulmonary affection remaining. In the spring of 1870 he went to live in New Jersey on a farm, and subsequently he became a farmer in Rhode Island. His health is reported now to be fair, but he is not free from cough and expectoration (June, 1875). He married and has two healthy children.

Case 9. Mr. C., aged 21, in August, 1851, had had cough for about two months, and he had had hæmoptysis twice. The physical signs showed a considerable affection at the summit of the left lung. In the autumn of this year he married and went to Florida. His health immediately improved; the cough nearly disappeared; he gained in weight and strength, and indeed, considered himself quite well. He returned to the North in June, 1852, and soon after his return his cough increased, and he began to lose what had been gained during the winter. I here only noted that he subsequently died.

Case 10. Dr. S., aged 24, in July, 1862, was examined by me, and the signs denoted a moderate affection at the summit of the right lung. He had had pleurisy with effusion eight months prior to this date, and the right side of the chest was contracted. He went to Europe in the autumn, and returned the following summer. Shortly after his return he married, and went to reside in central New York. In October, 1870, I noted that he had two healthy children. He had been in Europe a second time. His aspect was healthy, but he was not free from cough, and he had recently lost in weight. From this date he slowly declined. He went to Europe again in the autumn of 1873, and died there in the following spring, eight or nine years after marriage.

Case 11. Dr. B., aged 28, had profuse hæmoptysis in the spring of 1855, preceded by dry cough and deteriorated general health. He went to England, and returned as surgeon to an emigrant ship, his general health being then good, but cough persisting. In the winter of 1856–57 he officiated as demonstrator of anatomy at Buffalo and Toronto, and his health failed. He had pneumonia in the spring of 1857, and recovered slowly. The physical signs showed a considerable affection at the summit of the left lung. In June, 1857, he married, at that time being in medical practice in Canada. He had fair general health, but was never free from more or less cough and expectoration. He slowly declined, and died in November, 1859, two years and five months after the date of his marriage.

Case 12. Mr. S., merchant in Buffalo, aged 26, was examined by me in January, 1864. He had then recently married. Slight hæmoptysis had occurred two years previous to this date, and cough had existed for a year. The physical signs showed a moderate affection at the summit of the right lung. He had of late had diarrhœa. In June, 1864, I noted that he went to the West Indies without benefit, the diarrhœa persisting, and that he had recently died, the death being from six to eight months after marriage.

Case 13. Mr. W., aged 31, portrait painter, in December, 1849, had had cough for four months. The physical signs showed a moderate affection at the summit of the right lung. He changed his residence from Buffalo, N. Y., to a Southern State (Georgia or Florida), where he had comfortable health for two or three years. Meanwhile, he married, and had one child. He declined in the winter of 1852–53, returned home in June, 1853, and died shortly afterward.

Case 14. Mr. W., aged 21, had slight cough during the winter of 1871–72. In May, 1872, the physical signs showed a small affection at the summit of the left lung. During the summer, living much out of door in the country, he improved in appearance and gained in weight, the cough persisting. In October, 1872, he married and went to Europe. He returned in November, 1873. He stated that he was apparently quite well until he contracted malarial fever in Italy. He had, however, now but little cough and expectoration, and the physical signs showed the pulmonary affection to be still small. He went to Minnesota where he has since remained, and, as I have learned, in fair health. He had aphonia from chronic laryngitis on his return from Europe.[1]

Case 15. Mr. P., aged 32, merchant, from Illinois, consulted me in July, 1872. Cough had existed for a year. The preceding winter was passed in Mentone, under the care of Dr. Bennet. The physical signs showed a considerable affection at the summit of the left lung. His aspect was healthy. The appetite and digestion were good. A perineal fistula had existed since the preceding December. He married in the autumn of 1872, and passed the following winter in Mentone. He progressively improved during the winter and the next summer. He consulted me in October, 1873, and he stated that he was free from cough. His aspect was healthy. There were depression and deficient motion at the summit of the chest on the left side, with dulness on percussion, feeble, low respiratory murmur, increase of vocal resonance, and over the scapula the voice was bronchophonic. I have no further notes of this case.

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[1] This case and the next case have been recorded since 1870, and are not included in the collection of cases analyzed with reference to other points of inquiry.

Reviewing the facts in these 15 cases, in 10 the disease ended fatally, the duration from the date of marriage to death, in 14 of the cases, respectively, being as follows:—

Six weeks, eighteen months, eight to ten months, about fourteen years (in this case two marriages), about a year, eight or nine years, two years and five months, six or eight months, two to three years. In one case the duration is not noted, but the patient improved and apparently had nearly recovered during the six months following marriage (Case No. 9). The case in which the duration was six weeks, has been given in illustration of grave symptoms and speedy death occasionally following hæmoptysis (*vide* Chapter III., page 101). There were probably no sexual relations in this case. Judging from the duration in the other cases, it cannot be said that there is any evidence of marriage having exerted an unfavorable influence on the disease.

In 5 of the cases the patients were living, either in good or fair health, after a duration from the date of marriage in the cases respectively, as follows: eight or ten years, ten years, four or five years, three years, and one year. In these cases, assuredly, there is no evidence of an unfavorable influence of marriage on the disease.

I find among my cases only two of women who were evidently phthisical before marriage.

Case 1. Miss M., teacher, aged 21, consulted me in August, 1863. Two and a half years previously she had some acute affection of the chest, and kept the bed for two months. She had not been free from cough since that time. In the winter of 1862–63 she had hæmoptysis twice. There was dulness on percussion at the summit of the chest on the left side, with feeble respiratory murmur, subcrepitant rales and undue transmission of the heart-sounds. She was about five pounds below her standard weight. The appetite was rather poor. Her aspect was healthy, and the menses were regular. She subsequently married, became pregnant, and miscarried with twins. Death took place eighteen months afterward.

Case 2. Miss H., in August, 1852, was examined by me, and

I found the evidence of a small tuberculous affection. She soon afterward married, went to Florida, and died in February, 1853.

With respect to the first aspect of the question of marriage, namely, the effect on the patient, the conclusion to be drawn from the facts presented is, that the influence on the disease is not unfavorable. This conclusion, if I mistake not, is at variance with the opinion generally held by physicians. I am by no means prepared to say that it is to be recommended to a phthisical patient to marry; but, unless the analysis of a larger collection of cases should lead to a different conclusion, marriage need not be opposed by the physician, looking only to the welfare of the patient. The prevailing opinion against marriage, probably, is based on the supposition that the exercise of the sexual function will be injurious. Rationally considered, there is no ground for attributing to this exercise an injurious effect, if it be kept within physiological limits, that is, not abnormally increased by incitements operating through the mind; and the latter are hardly to be expected in patients affected with phthisis. On the other hand, there are moral influences connected with marriage which may be salutary. At all events, the circumstances, in individual cases, pertaining to the sentiments, often claim from the physician considerate attention. The marriage of a woman affected with phthisis involves the influence of pregnancy on the disease. This point of inquiry has already been considered (Chapter III., page 175). The cases which were cited appeared to show sometimes a favorable and sometimes an unfavorable influence.

With respect to the second aspect of the question of marriage, namely, the effect on offspring, I can only refer to the facts contained in the chapter on etiology in relation to a hereditary predisposition to phthisis. Several of the patients who married after becoming phthisical, had children, and it is noted that the children were healthy; but it is to be considered that a hereditary predisposition often gives no manifestation until after puberty, and my notes do not embrace the subsequent history of the children of these patients. That a predisposition may be inherited is shown by the number of cases in which either parents, or progenitors further removed, were affected with the disease, and by the instances in which several, or many, or all, of the children of a tuberculous parentage fall successively victims to phthisis. Our knowledge with reference to this point would be rendered much more complete by an analysis of a large number of cases of children of tuberculous parentage, and especially of children begotten after the development of phthisis, with reference to the proportion of instances in which the disease is developed; that is, the collection of cases should embrace the children of tuberculous parentage who escape, as well as those who become affected.

The third aspect of the question of marriage, namely, the possibility of the communication of the disease from the husband to the wife, or from the wife to the husband, involves the inquiry, Is the disease ever communicated through the intimate relations belonging to married life? I shall give a brief synopsis of the cases in my collection, containing facts relating to this inquiry.

Case 1. Mrs. W., widow, aged 28, consulted me in October, 1857. Phthisis had existed for a year and a half. Her husband had died with the disease, the date of his death not noted. Both of her parents died when she was young, one with pneumonia and the other with pleurisy. She had lost two sisters with phthisis, one a twin-sister. She had had a child which died three months after birth.

Case 2. Mr. F., aged 22, consulted me in August, 1864. Both parents were living and well. In November, 1863, he had married, and his wife was then affected with phthisis. She was still living in an advanced stage of the disease. He had hæmoptysis in March, 1864. He was now emaciated, and the physical signs showed unequivocally phthisis. At the time of his marriage he was in robust health. He had never had sexual intercourse with his wife, but he had most of the time occupied the same bed with her.

Case 3. F. L. W., aged about 40, had a profuse hæmoptysis in June, 1867. The signs then showed considerable solidification of the upper lobe of the right lung. The hæmoptysis recurred in July. Meanwhile the solidification had much diminished, showing that there had been an intercurrent pneumonia. In September, the solidification was moderate, and his general condition good. He subsequently went to Europe, and died in the spring of 1870. There were no tuberculous antecedents in the family of this patient, but his wife had died with phthisis not long before he had the disease (the precise length of time not noted), and he had devoted himself to attentions to her during her illness.

Case 4. Mrs. E., aged 28, consulted me in October, 1870. Her husband had died with phthisis two years before, and she was with him constantly during his illness. In February, 1870, she had pneumonia. Cough had continued since that time. Hæmoptysis had occurred in May. There had been diarrhœa much of the time for two months. She had lost twenty-one pounds in weight. The physical signs showed cavity at the summit of the right lung. Death took place in January, 1873.

Case 5. Mrs. O., aged 45, in February, 1855, had had phthisis for eighteen years. At this date her general health was fair. There was dulness on percussion at the summit of the chest on the right side, with increase of vocal resonance, and feebleness of the respiratory murmur. She had had numerous attacks of hæmoptysis. She had been married twenty-one years. Her husband had had phthisis for twenty-seven years. Repeated attacks of hæmoptysis had occurred in this case, but his general health was fair. There was no evidence of a family predisposition in the case of Mrs. O. Her mother died with apoplexy, and her father met with a violent death.

In my collection of cases these five are all that I find in which there is room for the suspicion of the disease having been communicated from the husband to the wife or the wife to the husband. By making inquiries of members of the medical profession, and searching periodicals, doubtless, a considerable number of similar cases might be obtained. Collected in this way, however, they would not prove communicability. According to the law of chances, a disease of such frequent occurrence as phthisis would affect in succession a husband and wife, or *vice versa*, in a certain proportion of cases. Conceding that the histories of some of my cases are defective in information on this point, it is certain that the instances in which transmissibility may be suspected are not sufficient in number to be not allowed for as coincidences. It must, therefore, be concluded that the analysis of my cases does not furnish facts sufficient to render the communicability of phthisis probable.

CHAPTER VI.

PHYSICAL SIGNS AND DIAGNOSIS.

Obstruction of a primary bronchus—Impulse of the aorta or of the pulmonic artery, and displacement of the heart from shrinkage of lung—Requirements for the recognition and interpretation of the physical signs of diseases of the chest—The true method of determining the individuality of signs and of their differentiation—The physical conditions in advanced phthisis—Cavernous signs—Signs in phthisis not advanced to the formation of cavities—Signs in incipient phthisis—Intercurrent pneumonia in cases of phthisis—Phthisis in cases of pulmonary emphysema—Signs in arrested or non-progressive phthisis, and after recovery from the disease—Signs in acute miliary tuberculosis—Signs in fibroid phthisis.

There are certain anatomical changes occasionally incident to phthisis, giving rise to physical signs, the interpretation of which may occasion embarrassment. One of these is an obstruction of a primary bronchus. This is to be inferred whenever the respiratory murmur over the whole of one side of the chest is relatively either notably feeble or suppressed, pleuritic effusion and solidification of the lung being excluded by vocal signs and those furnished by percussion and inspection. The evidence of obstruction existed in several of the cases in my collection. If the obstruction be persistent, it is not due to an accumulation within the primary bronchus or its branches, and the probable cause is the pressure of an enlarged bronchial gland. This was found on a post-mortem examination in one case, the opportunity of examining after death not being afforded except in one instance. In none of the cases which were under observation for a considerable period, did the obstruction disappear, but I have known it to be diminished. Of course, the suppression or great feebleness of the respiratory murmur on one side, prevents the manifestation of the respiratory signs of phthisis on that side. For the physical diagnosis reliance is to be had on the evidence afforded by inspection, percussion, palpation, the voice, and the whisper; and these are in general quite sufficient. Auscultation may, however, show a pleuritic friction murmur at the summit of the chest, an undue transmission of the heart-sounds, and, possibly, bronchial rales. The want of breath on exercise in these cases is out of proportion to the amount of the pulmonary affection, and is not, therefore, to be considered as any criterion of the latter. There is no reason to suppose that the obstruction favors the development or progress of the pulmonary affection on the side obstructed; if there be any influence it is perhaps the reverse of this.

Other anatomical changes relate to the situation of the heart and the primary arteries. Phthisis affecting the anterior portion of the upper lobe of the right lung, may cause a shrinkage which leaves the ascending portion of the aorta uncovered and drawn somewhat to the right of its normal situation. Under these circumstances, an impulse may be felt in the second intercostal space near the sternum, simulating that of aneurism.

A greater amount of shrinkage of the lung may occasion notable displacement of the heart, so that the cardiac impulse is felt on the right of the sternum. This was observed in several of my cases of advanced phthisis, the upper lobe of the right lung being greatly diminished in volume.

Diminution in volume of the upper lobe of the left lung not infrequently gives rise to a perceptible pulsation of the pulmonic artery in the second intercostal space close to the sternum ; and great shrinkage of this lobe may cause an ascent of the heart, leaving it so much uncovered that the cardiac impulses are felt in several of the intercostal spaces. I have met with instances of the latter in which the heart has been supposed to be the seat of disease.

Before proceeding to consider the signs and physical diagnosis of phthisis, it may not be out of place to state some propositions in relation to the exploration of the chest by means of auscultation and percussion.

In order to recognize and interpret the phenomena obtained by these methods, three things are requisite, namely: 1. Knowledge of the different abnormal physical conditions which morbid anatomical changes involve; 2. Knowledge of the physical signs which represent, respectively, these conditions; and, 3. Knowledge of the differential characters by which morbid physical signs are distinguished from each other and from the phenomena in health.

It must be distinctly understood that the various signs obtained by these methods, represent, not directly diseases, but abnormal physical conditions which are common to different affections. It is very evident that a knowledge of these is of primary importance in physical diagnosis. Having ascertained in individual cases their existence by a correct interpretation of their representative signs, the diagnostician has then to determine by the associated circumstances their diagnostic import, in other words, to make the diagnosis.

The significance of signs which represent abnormal physical conditions, rests on the uniformity of their association with the latter. This is established by observations during life, and examinations after death. Our knowledge of the representation of certain abnormal conditions by certain physical signs, rests on no other basis; and the knowledge is thus independent of our ability to explain the mechanism of the signs. An endeavor to determine representative signs by *a priori* reasoning, that is, by taking physical conditions as a standpoint, and deciding what signs ought to be produced, cannot but lead to error. Certain physical signs denote certain abnormal conditions, because clinical experience, inclusive of the study of lesions with the scalpel, has sufficiently established the fact.

Physical signs are to be studied, with reference to their individuality and differentiation, by analysis and comparison, taking as the point of departure the phenomena of health. The signs which are sounds, that is, those obtained by auscultation and percussion, are to be analyzed with regard to characters derived from the obvious differences among sounds, the most important of these differences relating to intensity, pitch, and quality. Having ascertained by means of this analysis the characters of healthy signs, the differential characters of morbid signs are to be determined by comparing them with each other, and with the phenomena of health; and it is desirable that the names given to signs should be expressive of their distinctive characters. So long as signs are determined from fancied analogies, and named from these, or after the person who describes them, there cannot but be obscurity and confusion.

The truths embodied in these few propositions seem to me to be fundamental as regards the physical diagnosis of diseases of the chest. With a knowledge of the significance of signs, and of their differential characters, resting on this foundation, physical diagnosis may be made simple, definite, and reliable. To enlarge upon these truths would be here not in place.

Proceeding now to the physical diagnosis of phthisis, the question at once arises, what are the abnormal physical conditions involved in this disease? I will answer this question, first, in so far as it applies to cases of advanced phthisis. The term advanced implies cavity, or, commonly, a greater or less number of cavities. With reference to these signs, it is immaterial to consider the mode of production of phthisical cavities; there are, however, various circumstances which affect the cavernous signs. The cavities vary in size, form, and situation. They may have flaccid walls which collapse with expiration, or the walls may be so rigid as to be always separated. They communicate more or less freely, by openings variable in number and size, with the bronchial tubes, the freedom with which the air passes into and out of the cavities depending, of course, on these circumstances. The communication with the tubes, and the tubes leading to the cavities, are liable to become temporarily obstructed by an accumulation of mucus. The cavities are sometimes empty and sometimes more or less filled with liquid morbid products. The cavernous signs are modified by these different circumstances. Signs distinctive of cavity are furnished by percussion, auscultation, and inspection.

Empty cavities containing air yield, on percussion, a tympanitic resonance. I use the word tympanitic to express a resonance devoid of the special, or vesicular quality of the normal resonance; the intensity variable, being either greater or less than the normal resonance, and the pitch also variable but always higher than that of health. With this definition of tympanitic resonance, it is consistent with dulness—"tympanitic dulness," to quote a term used by Stokes—and, although its intensity may be greater than that of the normal resonance, it is a sign entirely distinct from the vesiculo-tympanitic resonance which represents emphysema of lung, the latter sign having with an increase in intensity, and more or less elevation of pitch, the vesicular and the tympanitic quality combined in variable proportions. In short, a tympanitic is a non-vesicular resonance, and all resonance with no vesicular quality is tympanitic. A tympanitic resonance, however, is not distinctive of phthisical cavities. It may represent air in the pleural sac, that is, pneumothorax, and it may be elicited by percussion over the upper lobe when completely solidified, as in pneumonia, the resonance then being due to the air in the primary and secondary bronchial tubes. Certain modifications or varieties of tympanitic resonance are more characteristic, namely, a resonance with the cracked-metal and amphoric intonations. The cracked-metal and amphoric varieties of tympanitic resonance, singly, or, as is frequently observed, combined, if elicited within a circumscribed space, are quite distinctive of pulmonary cavity. These are not pathognomonic, for they are sometimes elicited over the primary bronchi when the intervening lung is solidified, and, especially in children, they may even be produced in that situation when the intervening lung is healthy.[1] As a rule, however, if within a circumscribed space, they are cavernous signs, and, as such, they are valuable. With the ear brought into close proximity to the patient's open mouth, they are often appreciated, when, otherwise, their characters are not perceived; and they are still better recognized by percussing when the pectoral extremity of the binaural stethoscope is brought close to the open mouth of the patient. Like the other cavernous signs, they are temporarily wanting when cavities are filled, or their communications with the bronchial tubes obstructed.

Auscultation, in certain cases, furnishes a distinctive respiratory sign, the cavernous respiration. I hope it will not be considered indelicate to claim here, and in relation to some other signs, some original points of observation, communicated to the profession more than twenty years ago. In 1852 I contributed the fruits of clinical studies relating to the variations of pitch in percussion and respiratory sounds.[2] The points then presented, together with further developments of study, are contained in works which I have since published.[3] Prior to the date of the first of these publications, variations in pitch entered very little into the differential characters of physical signs obtained by percussion and auscultation. These variations are now to a considerable extent recognized by auscultators, but not, as it seems to me, as fully and as generally as their importance deserves. The distinctions referable to pitch and to quality were not then, and are not now, sufficiently considered. By reference to these sources of difference, the distinctive characters of the ordinary cavernous respiration were then, as I believe I have a right to say, first pointed out. At that time the most approved authors on physical exploration, *e. g.*, Walshe, Skoda, Bath and Roger, did not undertake to distinguish, by well-defined differential characters, the cavernous from bronchial or tubular respiration. Now, after more than twenty years' continued clinical study, I can assert that the cavernous is as easily distinguished from the bronchial, as the latter is from the normal vesicular respiration. During this period I have been constantly in the habit of illustrating these differential characters at the bedside in courses of practical instruction. The characters of the bronchial or tubular respiration are, an inspiratory sound of variable intensity, with highness of pitch and a tubular quality, the expiratory sound as long as, or longer than, the inspiratory, still higher in pitch, usually more intense, and also tubular in quality. *Per contra*, the characters of the cavernous respiration are, an inspiratory sound low in pitch, non-vesicular in quality—a simple blowing sound—the expiratory sound still lower in pitch, with the same quality, its length and intensity variable. With a clear apprehension and practical knowledge of these differential points, the two signs cannot be confounded. The liability to error is in confounding the cavernous with the vesicular respiration, the chief point of difference being the presence of the vesicular quality in the latter and its absence in the former.

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[1] In the latter case the cracked-metal intonation accompanies, not a tympanitic, but a vesicular resonance.

[2] Prize Essay. Published in Transactions of the American Medical Association in 1852.

[3] Physical Exploration and the Diagnosis of Diseases affecting the Respiratory System, and the Principles and Practice of Medicine.

The cavernous respiration denotes a cavity with flaccid walls. Of course, for the production of the sign, the cavity must be empty, and there must be free communication with the bronchial tubes. If between the cavity and the walls of the chest there be solidified lung, the bronchial respiration, which represents the latter condition, may drown the characters of the cavernous respiration. It is not uncommon for the characters of the cavernous and the bronchial respiration to be combined in variable proportions, and this combination the practised ear is able to recognize. The term broncho-cavernous respiration expresses this combination. Sometimes the two signs are combined, thus: the inspiratory sound is cavernous and the expiratory is bronchial. The explanation is, the inspiratory sound comes from a cavity directly beneath the point of exploration, and the expiratory is propagated from the solidified lung in proximity to the cavity. It is by no means uncommon to find cavernous respiration and bronchial respiration in juxtaposition, as it were, the stethoscope with a little remove passing from the one to the other. Another mode of combination is this: the first part of the inspiratory sound is bronchial, and the latter part is cavernous, the probable explanation being that the air does not instantly enter the cavity, and until then the bronchial respiration is conducted to the ear, the conduction ceasing when the cavernous inspiration begins, or the cavernous then drowning the bronchial.

An amphoric intonation is not a very rare feature of cavernous respiration. An amphoric sound, if distinct, be it never so slight, always denotes pulmonary cavity, provided pneumothorax be excluded. It denotes a cavity with rigid walls, for it is evident that this sound can only be produced by a current of air at an orifice opening into a space which contains air.

Vocal signs are less distinctive of cavity than those of respiration. The voice occasions over the site of a cavity an increase of resonance and fremitus, sometimes extremely intense, but without the characters of bronchophony. These characters, namely, concentration, elevation of pitch, and nearness to the ear, denote solidification of lung. Pectoriloquy, without any solidification, has no special significance as a cavernous sign. Articulate words may be conducted by solidified lung as well as, if not better than, by the air in a cavity. There is, however, a cavernous pectoriloquy easily distinguished from that which denotes that solidified lung is the conducting medium. If the latter be the case, the pectoriloquy is associated with the characters of bronchophony; we may distinguish this as bronchophonic pectoriloquy. If the speech be transmitted solely through a cavity, the bronchophonic characters are wanting. Then the pectoriloquy is truly cavernous. This distinction I suppose to be original; I have for many years been accustomed to teach and illustrate it clinically.

Whispering pectoriloquy is a term used by Walshe and others. It is oftener found than pectoriloquy with the loud voice. But the former as well as the latter may be a sign of solidified lung as well as of cavity. Here, too, the whispered voice, when transmitted to the ear, is associated with characters which denote the mode of conduction. If transmitted through a cavity, the pitch is low and the quality blowing; if conducted by solidified lung, the pitch is high and the quality tubular. The cavernous pectoriloquy with the whispered voice is thus well marked as contrasted with bronchophonic whispering pectoriloquy.

Other whispering signs I believe I was the first to describe and name. The transmission through a cavity of the whispered voice, without speech, that is, without pectoriloquy, gives rise to the cavernous whisper. The whispered voice is also conducted by solidified lung. The latter is bronchophonic whisper. The two signs are readily enough distinguished from each other. The cavernous whisper is low in pitch and blowing; the bronchophonic whisper is high in pitch and tubular. The differential characters, thus, as is evident must be the case, correspond to those of the expiration in the cavernous and the bronchial respiration. The whisper is usually an act of expiration. If words be whispered with a certain emphasis and force, the characters are brought out with greater distinctness than even in forced breathing; hence, the whispering signs are not without practical value.

Another cavernous sign is gurgling, this name being sufficiently descriptive. I have also noted in a few cases well-marked metallic tinkling produced within a pulmonary cavity.

I have met with an amphoric friction-sound produced within a pulmonary cavity by the action of the heart. The case is, perhaps, *unique*, and I shall introduce the account as noted at the time the case came under my observation, namely, in October, 1870. "Lately, at Bellevue Hospital, my attention was called to remarkable sounds in the chest of a patient under the charge of my colleague, Prof. McCready. The sound was double; it continued when respiration was suspended, and was evidently caused by the action of the heart. It was heard on the right side of the sternum, over the whole upper and middle third of the chest. It had the character of a friction murmur with an amphoric intonation. The impulse of the heart was feebly felt on the right of the sternum, and not in its normal situation. In the middle third of the right side of the chest there was amphoric respiration with cracked-metal resonance on percussion. The sound produced by the action of the heart was generally present, but it was sometimes absent; and when absent there was more or less abundant expectoration before it returned. The sound could be heard several feet from the chest. The autopsy showed the heart lying beneath the sternum. Directly over and to the right of the heart was a cavity of the size of a small orange. The wall of the cavity was adherent to the pericardium, and was quite thin. The walls were flaccid. The inner surface of the cavity was irregular and rough. There was no pericarditis. Evidently the murmur was produced by the rubbing together of the inner surfaces of the cavity. The upper part of the right lung was solidified. The heart and lungs were exhibited at a meeting of the New York Pathological Society, October 26, 1870, by Prof. Loomis."

The loss of pulmonary substance within a circumscribed space, by the formation of a cavity, if the latter be near the superficies of the lung, sometimes occasions a visible depression of the walls of the chest within an area corresponding to the size of the cavity. This depression, in some instances, is so distinct that it is hardly a figure of speech to say that one can see the pulmonary cavity. Another cavernous sign obtained in some instances by inspection, is marked bulging within a circumscribed space whenever the patient coughs.

Pulmonary cavities are usually associated with solidification of lung more or less complete and extensive. Here is another important physical condition in cases of advanced phthisis. This solidification is caused by intra-vesicular morbid products not yet liquefied, or by the development of interstitial fibroid tissue, or by both combined. The solidification may be in the form of disseminated nodules varying in size, number, and situation ; or considerable portions of lung may be solidified.

Dulness on percussion, considerable or great, and even flatness, are signs representing this condition. The respiratory signs are the bronchial and the broncho-vesicular respiration. The characters of the bronchial respiration have been already stated in comparing it with cavernous respiration. The term broncho-vesicular was introduced by me many years since to embrace the abnormal variations between the normal vesicular and the bronchial respiration, the characters of both being combined in variable proportions corresponding to the amount and extent of solidification. If the inspiratory sound have any recognizable vesicular quality, it is not bronchial, but broncho-vesicular. The vesicular and the tubular quality are mixed, the pitch being high in proportion as the tubular quality predominates; and the expiratory sound, as a rule, is prolonged, intense, and high in pitch, in proportion as the tubular predominates over the vesicular quality in the inspiration.

Solidification of lung sufficient to give rise to a bronchial respiration, or to a broncho-vesicular approximating to the bronchial, is generally represented by well-marked bronchophony. If, however, the solidification give rise to a broncho-vesicular respiration which approximates to the normal vesicular, there is simply increase of the vocal resonance without the bronchophonic characters, namely, concentration, nearness to the ear, and notable raising of pitch. The correlative whispering signs are the bronchophonic whisper and increased bronchial whisper, the latter having less intensity, less tubularity, and less elevation of pitch than the former.

A fair interpretation of these signs will show the amount and extent of solidification which, in advanced phthisis, is usually associated with cavities, and which exists without the latter at an earlier period in the course of the disease.

There are certain incidental or accessory physical conditions which do not belong exclusively to advanced phthisis, although more marked than previously in the course of the disease. One of these is the presence of liquid morbid products within the bronchial tubes. These products consist of mucus, serum, mucopus and liquefied exudation matter. Hence, the moist bronchial or bubbling rales, varying in coarseness or fineness according to the size of the tubes. The subcrepitant rales may be included among these, and they are often present within circumscribed spaces in cases of phthisis. Loud bubbling bronchial rales may drown the bronchial or broncho-vesicular respiration, or the presence of the liquid causing the rales, by obstructing the bronchial tubes, may interfere with the conduction of these respiratory signs. Under these circumstances, the pitch of the rales enables the auscultator to judge respecting soldification. The rales produced within bronchial tubes surrounded with solidified lung, are higher in pitch; if the adjacent lung be not solidified, the rales are relatively low in pitch.

The destruction of pulmonary structure and the collapse of lobules incident especially to advanced phthisis, diminish the volume of the lung; hence, depression of the thoracic walls in the anterior upper third of the chest. This is often very marked on inspection, or it may be determined by the callipers. Pleuritic adhesions, also, form another condition which is rarely wanting, and this, together with the reduced volume, restrains the superior costal movements on the side most affected.

To determine the existence of phthisis when it is advanced, is one of the simplest of the problems in physical diagnosis. The practical importance of the signs which have been noticed, consists in the evidence which they afford, not only of the existence of phthisis, but of the extent of its advancement, and the amount of damage which the lungs have sustained. In the latter point of view, the knowledge obtained by these signs has an important bearing on the prognosis.

I pass to the physical conditions and signs pertaining to phthisis not advanced to the formation of cavities. The most important physical condition is solidification. With reference especially to the degree and extent of this condition, cases of phthisis have been graded in the preceding chapter as cases with a large, a considerable, a moderate, and a slight pulmonary affection. The physical diagnosis, when the affection is large or considerable, and even when it is moderate, is, in general, sufficiently easy. But here, as in cases of advanced phthisis, it is desirable, after the diagnosis has been made, to determine the amount of the affection, that is, whether it be large, considerable, or moderate. This is to be determined by means of the physical signs.

The signs are those of solidification of lung, and they have been already mentioned in connection with the cavernous signs. The bronchial respiration, bronchophony, and the bronchophonic whisper, together with increased vocal vibration, or fremitus, represent the degree of solidification to be complete or considerable. The area over which these signs are heard, corresponds nearly with the extent of lung solidified. Of course the signs denote the situation, or the situations, of the solidification. Either of these three signs may be absent in individual cases; but it almost never happens that all three are wanting, and in most instances each is present. Diminished volume of lung and pleuritic adhesions in a considerable proportion of cases exist sufficiently to cause depression or flattening of the chest, and deficient superior costal motion. Moist bronchial rales, including the subcrepitant, are oftener present than absent, denoting the coexistence of secondary bronchitis affecting the tubes within the portions of lung affected with phthisis. Of course, the diagnostic symptoms in the present and previous history are to be considered in connection with the physical signs. There may be physical conditions other than solidification, diminished volume of lung, pleuritic adhesions, and liquid in the bronchial tubes, giving rise to signs. I defer notice of these in order to connect them with the diagnosis in cases of phthisis when the pulmonary affection is small, and I proceed now to consider the signs in this class of cases.

The diagnosis of a small affection, or of incipient phthisis, is not always an easy problem. It requires, at all events, more knowledge and skill in the practice of physical exploration than the cases thus far considered. The great importance to patients of an early diagnosis is rendered evident by my studies which have shown that arrest of the disease and recovery are far more likely to take place if the affection be small, than if it be considerable or large. Moreover, there is a negative, as well as positive, aspect of the problem; in other words, while it is extremely desirable to determine the existence of phthisis in its incipiency, it is also highly important to be able to exclude phthisis if it do not exist. What then are the physical conditions and signs which are involved in the diagnosis of incipient phthisis?

The presence of miliary tubercles or of small disseminated nodules, occasions solidification, so that this is still the most important physical condition, and it is represented by dulness on percussion. Inasmuch as the normal resonance on percussion in different persons varies considerably, and it is, therefore, necessary to determine in each case the standard of health in that person, an equal amount of fulness on the two sides would not be readily determinable. Happily for diagnosis, there are very few exceptions to the rule that the pulmonary affection commences in one lung, and is greater on the side first affected after the other lung is invaded; hence the relative dulness on percussion of the side alone or most affected, is determinable. In this connection, as with reference to other signs in the diagnosis of a small affection, allowance must be made for the normal disparity between the two sides of the chest. In the upper, anterior third, the resonance on percussion in health is greater, lower in pitch, and has more vesicular quantity on the left, than on the right, side; in other words, the resonance on percussion on the right side is relatively dull. It follows that there are instances in which it is not easy to decide whether a slight relative dulness at the summit of the chest is normal or morbid, especially as the amount of the disparity between the two sides in health is not uniform, but varies in different persons. Hence, as is evident, it is far easier to determine an abnormal dulness in the left, than on the right, side. I need not say how important it is to observe all the rules for the practice of percussion when it is a question as to the existence, or not, of slight dulness. A very slight variation in the symmetry of the chest from the position of the patient, will suffice to cause relative dulness on one side. Of course, if, for any reason, the chest have not a normal symmetry, the dulness must be more than slight to be considered as a sign of pulmonary disease.

There is a contingency which sometimes interferes with dulness on percussion as a sign in phthisis, not only when the affection is slight, but when it is moderate and perhaps even considerable. This is the occurrence of lobular emphysema between the disseminated nodules. Phthisis developed secondarily to lobar emphysema (happily for diagnosis, rare), I shall notice separately. Emphysematous lobules associated with tubercles or tuberculous nodules, may increase the resonance on percussion, so that it is greater on the side affected with phthisis than on the opposite side. But the resonance, under these circumstances, will have, aside from its intensity, the characters which denote emphysema, namely, elevation of pitch and a quality in which the tympanitic and the vesicular are combined, constituting the sign which I have called for many years the vesiculo-tympanitic resonance. The physical diagnosis of phthisis, in these cases, must rest on the auscultatory signs.

A slight dulness on percussion, as a sign of incipient phthisis, is often quite as appreciable over the scapula as in the upper anterior portion of the chest. In both situations the ear is aided by attention to the pitch of the sound. With dulness the pitch is always raised. This fact I pointed out in my prize essay, in 1852. Attention to the pitch enables the explorer to appreciate a slight dulness, of which he might not be sure were the attention directed exclusively to the intensity of the sound.

The respiratory sign which represents a small amount of solidification of lung, is the broncho-vesicular, its characters approximating nearer to the normal vesicular than to the bronchial. The inspiratory sound of variable intensity has the vesicular and the tubular quality combined, the pitch raised in proportion to its tubularity, and the expiration prolonged, and high and tubular in correspondence with the characters of the inspiration. The inspiratory sound may be alone heard, but the expiratory oftener; both, however, are generally present. Here, again, it is essential to make due allowance for a normal disparity between the two sides of the chest, especially in the infra-clavicular and interscapular regions. The inspiratory sound, in most healthy persons, on the right side, is less intense, but higher in pitch and somewhat tubular, and the expiratory sound is often prolonged and sometimes high and tubular. *Per contra*, on the left side the inspiratory sound is louder, lower, and more vesicular, and the expiratory sound short, weak, and low, or it may be wanting. In other words, the respiratory murmur at the right, as compared with that at the left summit, especially over the site of the primary and secondary bronchial branches, has the characters of the broncho-vesicular respiration. It might be called, not the normal bronchial (as it has been), but the normal broncho-vesicular respiration. Owing to this disparity between the two sides, the question arises, is there present at the right summit a morbid, or only the normal, broncho-vesicular respiration? This question is to be decided by the testimony of an experienced ear, and by the associated signs. As with slight dulness on percussion, so with this respiratory sign, its existence is much better determined at the left than at the right summit of the chest. An inspiratory sound on the left side higher in pitch than on the right, and an expiratory sound prolonged, and the pitch more or less raised, is certainly morbid.

May not a prolonged expiration be due to emphysema, and, therefore, not a sign of phthisis? The answer to this question involves distinctions relating to pitch and quality, which, so far as I know, were original with me. The pitch and quality of the prolonged expiration in emphysema, are the same as in health; the only changes are in length and intensity. On the other hand, the prolonged expiration which represents solidification of lung, is always more or less raised in pitch and tubular in quality. Appreciating these differential characters, the prolonged expiration due to emphysema can never be confounded with the prolonged expiration which has the significance of the bronchial or the broncho-vesicular respiration.

Does a slight solidification of lung always give rise to a broncho-vesicular respiration? It gives rise to no other modification of respiration, excepting weakness of the respiratory murmur. The latter is, however, common. The weakness is often such that the broncho-vesicular characters are not appreciable; and the murmur may be suppressed. Hence, a frequent sign of incipient phthisis is either weakened or suppressed respiration over the site of the affection.

The correlative vocal and whispering signs, in cases of incipient phthisis, are, increase of the vocal resonance and of the sound heard with whispered words in health, that is, the normal bronchial whisper. Here, still again, the normal disparity between the two sides of the chest must be taken into account. The vocal resonance on the right, is always greater than on the left, side, and the disparity, which is not in all healthy persons uniform, is sometimes very marked at the right summit; indeed, in some healthy persons, there is well-marked bronchophony. The normal bronchial whisper at the summit of the chest on the right side is louder than on the left side, but the pitch is a little higher on the left side. Not infrequently a small affection at the summit of the left lung does not increase the vocal resonance sufficiently to render it equal to the normal resonance on the right side. This is rarely so with the bronchial whisper, and, hence, an increased bronchial whisper is more available than vocal resonance as a sign of incipient phthisis.

An undue transmission of the sounds of the heart in the infraclavicular region, is a frequently available sign of slight solidification. There is some disparity in health in this situation, as regards the heart-sounds. The first sound is a little louder on the left than on the right side, and the second sound is a little louder on the right side. These nice points of difference, so far from causing embarrassment, assist the auscultator in appreciating an abnormal disparity.

The foregoing statements respecting the points of normal disparity between the two sides of the chest, as regards respiration, voice, and whisper, are based on the analysis of a considerable number of instances in which the phenomena in healthy persons, with well-formed chests, were carefully studied, and noted at the instant of observation. I have been in the habit of illustrating them to students in auscultation for more then twenty years. In order to become practically conversant with them, it is of course essential for the auscultator to devote attention to the study of the healthy chest. This study, as it is obvious, is a necessary preparation for becoming practically acquainted with those abnormal modifications of respiration, voice, and whisper, which are the physical signs of disease. Healthy subjects, indeed, furnish, to a considerable extent, examples of morbid signs; thus, the type of bronchial respiration is the normal tracheal or laryngeal; the characters of the broncho-vesicular respiration may be studied often over the right primary bronchus; dulness and flatness on percussion can, of course, be illustrated, and tympanitic resonance is obtained by percussing the abdomen. Moreover, by the study of the healthy chest the ear is educated, and tact in percussion is acquired. The study is to be enjoined upon all who enter upon the undertaking of becoming experts in physical exploration. I cannot tell for what reason, but, in my experience as a practical teacher, I have found it most difficult to enforce due appreciation of the importance of this study.

The following case is given in illustration of the small amount of solidification determinable by physical signs: The patient was a discharged soldier, aged 39, admitted into Bellevue Hospital in 1867. I quote the record made of the case by Dr. R. A. Vance, at that time my clinical assistant. "When admitted he was suffering from Bright's disease, and he gave no history of pulmonary trouble. On a physical examination, the evidence of a small deposit of tubercle was found at the apex of the right lung, in front. There was also an aortic direct murmur. He was used by Dr. Flint to demonstrate the physical signs of a small or moderate deposit of tubercle on several occasions. The signs present were a broncho-vesicular respiration, increased vocal resonance and whisper within a circumscribed space at the right summit. During the latter part of March he was employed as an assistant in the apothecary shop, where he accidentally took an overdose of the fluid extract of aconite, which proved fatal. On the post-mortem examination, the lungs were carefully examined, and at the anterior part of the summit of the right lung was a tuberculous mass of the size of a hazlenut. No other tuberculous deposits were found. The heart was healthy. The kidneys were diseased—the large, white variety. The mucous membrane of the stomach and intestines was congested, and other organs were healthy."

Physical conditions incidental to the small amount of solidification in incipient phthisis, may give rise to signs which are useful in diagnosis. These may be distinguished as the accessory signs of phthisis. Fine bubbling and the subcrepitant rales are in this category. They denote, not necessarily softening of exudation matter, but circumscribed bronchitis. This local complication in phthisis precedes softening, and may occur early in the disease. Now, a circumscribed bronchitis at the apex of the lung is strong proof of phthisis; hence, the significance of the signs. This statement is also true of a circumscribed pneumonia which sometimes occurs, and may be represented by a crepitant rale; hence, a crepitant rale within a circumscribed space at the summit of the chest on one side, is a significant accessory sign of phthisis. A pleuritic friction murmur within a circumscribed space at the summit of the chest on one side has the same significance, representing the exudation of lymph on the pleural surface, prior to adhesions. Interrupted, wavy, or jerking respiration, and crumpling or crackling sounds, if limited to a situation at or near the apex of one lung, are to be included in the list of accessory signs. These signs, singly or collectively, are by no means constantly present, but, when present, they have much diagnostic value, taken in connection with the direct signs, that is, those representing solidification.

An intercurrent pneumonia, not lobar, but not circumscribed within a very small area, is an occasional complication in cases of phthisis. The temporary solidification which it occasions is likely to mislead as to the amount of the phthisical affection. More or less slowly the pneumonic exudation is absorbed, and the phthisical affection may then be found to be small. Until evidence is afforded by the progress of resolution (which, although it may be slow, is too rapid for the absorption of a phthisical exudation), it is impossible to determine the extent to which the solidification is due to this complication, or whether the complication exists. After an intercurrent pneumonia in cases of phthisis, notable dulness on percussion may remain for a considerable period, this sign being out of proportion to the amount of solidification of lung as represented by the respiratory and vocal signs. This disproportionate dulness on percussion is referable to the exudation of lymph on the pleural surfaces, its absorption taking place here always slowly.

Phthisis developed consecutively to pulmonary emphysema, is rare. The latter undoubtedly is protective against the former, as a rule, to which there are some exceptions. The emphysema offers certain obstacles in the way of the physical diagnosis. It may not be easy to obtain the evidence by percussion of solidification of lung, and the feebleness of the respiration may prevent the appreciation of the bronchial or the broncho-vesicular characters. Much reliance, under these circumstances, is to be placed on the vocal signs of phthisis, and on the presence of moist rales at the summit of the chest. The coexistence of the symptoms of phthisis, which are always to be considered, is of special importance in these cases.

In cases of arrested or non-progressive phthisis, in which there are cavities, the cavernous signs are sometimes marked, when there are few and perhaps no signs denoting solidification of the lung. The inference is, that there has been no recent exudation, and that the exudation which had previously existed, having been liquefied, has either been expectorated or absorbed. Another inference is that there is not much interstitial pneumonia.

If the arrest of the disease has taken place when it had not advanced to cavities, and when the pulmonary affection was small, the physical signs are, some dulness on percussion, with relative feebleness of the respiratory murmur, and perhaps some increase of vocal resonance.

Recovery from phthisis, with cicatrization of cavities, may leave, as physical signs of the disease having existed, notable depression at the summit of the chest and deficient motion, with dulness on percussion, feebleness of respiratory murmur, and more or less increase of vocal resonance. With the aid of the previous history in connection with the physical signs, a retrospective diagnosis of phthisis is practicable.

The preceding account of physical signs and diagnosis has had reference to the ordinary form of phthisis. The signs in acute miliary phthisis present notable points of difference. The dissemination of miliary tubercles or granulations equally throughout both lungs, gives rise to no distinctive physical signs obtained by percussion or auscultation. The diagnosis must rest on the history and symptoms, together with more or less cough and expectoration, frequency of the respirations, perhaps lividity of the prolabia and hæmoptysis, taken in connection with the absence of the evidence of solidification of lung. Some moist bronchial rales are likely to be heard, and, from the history and symptoms, capillary bronchitis is to be excluded. In illustration of the difficulty of diagnosis in some cases of acute tuberculosis, I shall introduce a brief account of a case which came under observation recently:—

In April, 1875, I saw with Dr. T. R. Varick, of Jersey City, Mrs. A. Dr. Varick had had charge of the case for a couple of days only, and had considered it to be one of acute tuberculosis. The patient had been ill for five or six weeks. She had had chills which had been arrested with quinia. The chills were followed by fever and sweating, and they occurred in the afternoon. When I saw her she was feeble and thin, the pulse was small and weak, and there was no febrile movement. She had considerable cough. My examination of the chest, which, owing to the debility of the patient, was not very thorough, was negative. My opinion (which I have characterized in my record as a rash one) was adverse to miliary tuberculosis. The patient died on the following day, and a post-mortem examination showed miliary tubercles in great abundance in both lungs, and no other pulmonary lesion.

In my collection of cases are some which were considered cases of fibroid phthisis, or cirrhosis of the lung. The physical diagnosis was based on the following signs, limited to one side of the chest: Contraction of the affected side, notable dulness on percussion with tympanitic quality, bronchial or broncho-cavernous respiration, bronchophony, with perhaps pectoriloquy. In one of my cases the affection was limited to the lower lobe of the left lung, and the case is interesting from the long duration of the disease and the good general health of the patient. The following is a brief account of this case:—

Phœbe S., aged 5 years, came under my observation in 1864. There was at that time great dulness on percussion over the lower lobe of the left lung, with bronchial respiration and bronchophony. She had cough and expectoration, but had at no time been confined either to the bed or house, and her general health was fair. The treatment consisted of tonic remedies and out-of-door life. I saw her repeatedly for two or three years, the physical signs remaining the same, and her general health fair. In 1869 she had chorea, and was treated with Fowler's solution. I did not see her again until in October, 1871. She had now, and had never been free from, some cough and expectoration, but her general health had been maintained. The signs of solidification of the lower lobe of the left lung were still present, the upper lobe remaining unaffected. In November, 1874, I noted that I had again seen her and examined the chest. The dulness on percussion over the lower lobe of the left lung continued; there was, at this time, absence of respiratory sound over this lobe, but the vocal resonance was greater than on the opposite side. The left side was considerably contracted. This was ten years after the date of my first examination. She still had some cough and expectoration, and there was some deficiency of breath on active exercise. Her aspect was healthful, and she was well developed for her age (15 years). Menstruation was irregular. She came to me for this irregularity, not considering herself an invalid in other respects.

This case is in the list of cases of arrested or non-progressive phthisis.

As a concluding remark, I may remind the physicians that phthisis, not only in the form distinguished as fibroid, but the ordinary form, exceptionally is seated primarily in a lower lobe. The instances are rare, but my collection of cases embraces several. If this be not borne in mind, the exploration of the chest, in cases of suspected phthisis, may be limited to the upper part, and the physical signs denoting the disease be overlooked.

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